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ABSTRACT

This bibliography was published as a result of a cooperative education effort of the United States Sea Grant programs and the staff of the Living Seas pavilion presented by United Technologies at EPCOT Center in Orlando, Florida. It is a compilation of the textbooks, curricula materials, and other marine education resource materials developed by individual Sea Grant programs. The materials outlined in this bibliography are available from the Sea Grant program or institution that developed them. Entries include ordering instructions and information about materials available free or at cost. Programs include University of Alaska, the University of California, Connecticut Sea Grant College Program, University of Delaware, State University System of Florida, University of Georgia, University of Hawaii, Illinois-Indiana Sea Grant Program, Louisiana Sea Grant, University of Maine, University of Maryland, Massachusetts Institute of Technology, Michigan Sea Grant College Program, Minnesota Sea Grant College Program, Mississippi-Alabama Sea Grant Consortium, University of New Hampshire Sea Grant Extension Program, New Jersey Sea Grant College Program, New York Sea Grant Institute, University of North Carolina Sea Grant Program, Ohio Sea Grant College Program, Oregon State University, Pacific Science Center/Washington Sea Grant, University of Puerto Rico, Rhode Island Sea Grant, South Carolina Sea Grant Consortium, University of Southern California Sea Grant Institutional Program, Texas A&M University, Virginia Sea Grant College Program, University of Wisconsin Sea Grant, and the Woods Hole Oceanographic Institution. (KR)

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A Bibliography of Educational Materials Available from the Nation's Sea Grant College Programs

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A Bibliography of Educational Materials Available from the Nation's Sea Grant College Programs

January 1991

For additional copies of this bibliography contact the Sea Grant Program in your state or region. Copies are also available from **Sea Grant Marine Education Bibliography**, Gulf Coast Research Laboratory, J.L. Scott Marine Education Center and Aquarium, P.O. Box 7000, Ocean Springs, Miss. 39564-7000, (601) 374-5550. $2.00/copy for single copies; $1.50/copy for bulk orders in lots of 50.

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Foreword

This bibliography was first published as a result of a cooperative education effort of the nation's Sea Grant programs and the staff of The Living Seas pavilion presented by United Technologies at EPCOT Center in Orlando, Florida. A compilation of the textbooks, curricula materials and other marine education resource materials developed by individual Sea Grant programs, the original publication was intended for use with the education program of The Living Seas and in the EPCOT Outreach/Teacher's Center.

This cooperative effort was a natural outgrowth of the intersecting missions of Sea Grant, The Living Seas and the EPCOT Outreach/Teacher's Center. When Congress established the National Sea Grant College Program in 1966, Sea Grant was charged with the mission to promote the understanding and wise use of our oceans and Great Lakes through research, education and public service. The materials included in this bibliography are evidence of Sea Grant's meeting that Congressional mandate for formal and public education.

Sea Grant and the concept of a Living Seas pavilion were introduced at a Sea Grant Association meeting when Kym Murphy, originator of the concept, displayed a model of the proposed facility. Bob Wildman of the National Sea Grant College Program was appointed to the Advisory Committee of The Living Seas in 1981 and representatives of the State University System of Florida Sea Grant College Program monitored program development. In 1986 Marion Clarke, Florida's Sea Grant Extension Program leader, met with Murphy and representatives of the education department of The Living Seas and the EPCOT Outreach/Teacher's Center to explore the potential for cooperative efforts. Committees comprised of representatives of programs from throughout the National Sea Grant network were appointed, and the bibliography was a result of their work. All Sea Grant programs contributed information, and Texas Sea Grant produced the bibliography.

The **Marine Education Bibliography** has proven useful to a wide range of educators, and demand has far exceeded supply. To help meet that demand the Mississippi-Alabama Sea Grant Consortium, under the leadership of Director James I. Jones, assumed fiscal and administrative responsibility for publishing and distributing an update of the bibliography. Texas Sea Grant coordinated production, and Florida Sea Grant maintained contact with the EPCOT Outreach/Teacher's Center and The Living Seas. Through these efforts and the cooperation of the National Sea Grant network, the bibliography is again available as a tool for teachers and other individuals interested in helping students explore and understand our oceans and Great Lakes.

The materials outlined in this bibliography are available from the Sea Grant program or institution that developed them. Entries include ordering instructions and information about materials available free or at cost.

Alaska Sea Grant College Program
University of Alaska Fairbanks
138 Irving II
Fairbanks, AK 99775-5040
(907) 474-7086

Sea Week Curriculum Series. A set of six books, each with a teacher's and children's workbook. Both adults and children have found them an enjoyable way to learn about Alaska's marine and river resources.

Discovery, An Introduction, Grade K. AK-SG-83-06. 140 pp. $6.50.

Animals of the Seas and Wetlands, Grade 1. AK-SG-85-11. 200 pp. $12.00.

Shells and Insects, Grade 2. AK-SG-84-04. 200 pp. $12.50

Birds and Wetlands of Alaska, Grade 4. AK-SG-88-01. 187 pp. $12.00.

Fish and Fisheries, Grade 5. AK-SG-83-07. 275 pp. $11.50

Mammals and Marine Issues, Grade 6. AK-SG-84-08. 300 pp. $17.00.

Marine Animal Life Cycle Posters. AK-SG-77-03. $1.00 each.
A series of five posters, each measuring 24" X 36", that depict the life cycles of pink shrimp, ocean perch, weathervane scallop, and halibut.

Oceans of Plastic. AK-SG-88-07. 68 pp. $5.00.
This booklet is a summary of a workshop on fisheries-generated marine debris and derelict fishing gear. It presents a critical discussion of options for fishermen to self-regulate their refuse disposal, including financial incentives, technology changes, and educational efforts.

Persistent Marine Debris. SG-ED-01. 1988. 41 pp. No charge for up to 10.
This richly illustrated color booklet describes the extent and sources of marine debris, identifies how the debris affects wildlife and humans, and recommends how the federal government and others can work to alleviate the problem.

Alaska Seafood Industry Study. SG-ED-02. 1989. 22 pp. No charge for up to 10.
This easy to read summary provides economic data and a brief history of the Alaska seafood industry. It is a well-illustrated booklet on the industry that is the largest private employer in Alaska.

A Guide to Cleaning up Beach Debris in Alaska. SG-ED-03. 1989. 16 pp. No charge for up to 10.
This booklet includes everything schoolteachers, community leaders, and individual citizens need to know about how to organize a successful beach cleanup in Alaska. Most information can be applied in any ocean or Great Lakes coastal area.

Marine Debris...In Alaska? SG-ED-04. 1989. Brochure. No charge.
This illustrated brochure provides information on the environmental damage caused by ocean debris in Alaska and outlines steps citizens can take to reduce the amount of man-made debris in the oceans and on beaches.

MARPOL V poster. SG-ED-05. 1989. 14" X 22", No charge for up to 25.
The poster graphically summarizes trash disposal regulations for sea-going vessels, with emphasis on the ban on disposing of all plastics at sea.

Lessons of the *Exxon Valdez*. SG-ED-08. 1990. 24 pp. $4.00.
This color-illustrated booklet includes an essay by University of Alaska Sea Grant Marine Advisory agent Rick Steiner, written shortly after the Alaska spill, that outlines ways to avoid future oil spill disasters. Other chapters describe effects of the Alaska oil spill on wildlife, human health, and local economies, including Native villages; and chapters on oil spill cleanup technology and state and federal legislation spurred by the spill. Also features an annotated bibliography that describes more than 50 articles, books, and videos on various aspects of the spill. Suitable for high achool level and above.

Report from the Alaska Sea Grant College Program 1985-1988. AK-ADMIN-18. 48 pp. No charge for up to 10.
Featured in this illustrated booklet is a nine-page story on the *Exxon Valdez* oil spill and cleanup. Several articles are included that describe the Alaska Sea Grant College Program and 1985-1988 activities.

Guide to Northeast Pacific Rockfishes: Genera *Sebastes* and *Sebastolobus*. MAB-25. Revised 1988. 86 pp. $10.00.
This plastic-laminated guide simplifies the identification of 36 species of rockfish found along the Alaska and British Columbia coast, with color photographs for each species. It is particularly useful for fishermen, processors, fisheries managers, and divers.

Surviving on the Foods and Water of Alaska's Southern Shores. MAB-38. 1989. 25 pp. $5.00.
This booklet gives basic information on nutritional needs of the human body and some wilderness sources to meet those needs. Southeastern Alaska

boaters and hikers will find the publication helpful.

Ordering Instructions for books: Make checks payable to Alaska Sea Grant. Add $2.00 for shipping. Send orders to:

Alaska Sea Grant College Program
Communications Office
University of Alaska
138 Irving II
Fairbanks, AK 99775-5040

Video Programs (Available from University of Alaska Marine Advisory Program in Anchorage)

Hypothermia. MAPV-1. 1983. 15 min. $15.00.
The videotape defines hypothermia, the environmental conditions that cause it, preventive methods, symptoms, and treatment. Workbook available, $3.50.

Cold Water Near Drowning. MAPV-2. 1983. 20 min. $15.00.
Cold water near drowning is defined, and treatments to be administered to a victim are described. Workbook available, **SG-ED-10**, $4.00.

Sea Survival. MAPV-3. 1983. 21 min. $15.00.
This video explains seven steps to survival in the event of a disaster at sea.

Shore Survival. MAPV-4. 1983. 22 min. $15.00.
The videotape reiterates the seven steps to survival presented in *Sea Survival*, but relates these steps to survival on shore. Workbook available, $3.50.

Trashing the Oceans. MAPV-9. 1988. 8 min. $15.00.
This video describes the causes of marine debris and the damage it creates. A few solutions to the marine debris problem are mentioned.

Frostbite and Other Cold Injuries. MAPV-17. 1988. 16 min. $15.00.
This video graphically describes injuries that can be suffered by victims of frostbite, and explains how frostbite and other cold injuries can be prevented and treated. Good for junior high level and above. Used by Alaska State Troopers, Iditarod mushers, and other outdoor groups. Workbook available, **SG-ED-07**, $4.00.

It Could Have Been Prevented. MAPV-18. 1990. 17 min. $15.00.
This dramatic instructional video addresses small boat safety in rural Alaska. Effects of alcohol, weather, boaters hypnosis, and stability are discussed.

Ocean Ranching. MAPV-19. 1990. 29 min. $15.00.
Alaska's world renowned commercial and recreational salmon fisheries depend on production from a network of state and privately run hatcheries, some of the largest in the world. This video takes the viewer inside these state-of-the-art facilities and shows how they operate and describes problems faced by fisheries biologists and hatchery managers. Includes a short history of how the hatchery system in Alaska developed. Ideal for classroom use, public television broadcast, and for anyone interested in modern salmon hatchery production.

Ordering Instructions for videos: Make checks payable to Alaska Marine Advisory Program. Add $2.00 for shipping. Send orders to:

University of Alaska
Marine Advisory Program
2221 E. Northern Lights Blvd., Suite 110
Anchorage, AK 99508-4140
Telephone (907) 274-9691

California Sea Grant College Program

University of California A-032
La Jolla, California 92093-0232
(619) 534-4446

Directory of Academic Marine Programs in California, Second edition, 1985. Publication No. **R-CSGCP-014**. California Sea Grant College Program. $1.00 (postage and handling).
A guide for teachers and students to undergraduate and graduate courses of study in the marine sciences at California colleges and universities.

Salt Marsh Vegetation: Examples from the Tijuana Estuary. Joy B. Zedler. 1982. Publication No. **E-CSGCP-0003** (English version) and **E-CSGCP-004** (Spanish version). $1.25.
These 40-page publications describe salt marsh vegetation in Southern California using the Tijuana Estuary as an example and explain how marsh plants are able to tolerate the stresses of the environment. Specify English or Spanish version when ordering.

Ordering Instructions: Mail check or money order, payable to UC Regents, to:

California Sea Grant College Program
A-032
University of California
La Jolla, CA 92093-0232

Connecticut Sea Grant College Program

The University of Connecticut
Avery Point
Groton, Connecticut 06340
(203) 445-3457

Notes on Connecticut's Coastal and Marine Resources. CT-SG-87-09.
Observations from on-the-water workshops in conjunction with Project Oceanology. Topics include Connecticut's estuaries, marine fisheries, shellfisheries and seafood secrets. 16 pages.

Long Island Sound Study Fact Sheet Series
Environmental issues facing Long Island Sound. A joint project of the Connecticut and New York Sea Grant Programs as part of the Long Island Sound Study public education program. The following fact sheets are available:

1 — Hypoxia in Long Island Sound
2 — Modeling Long Island Sound
3 — Wastewater Treatment
4 — The LISS: a Profile
5 — Supporting the Sound
6 — Priority Action Plan Demonstration Projects
7 — Nonpoint Source Pollution
8 — Floatable Debris
9 — Seafood Issues

Adding Marine Education to Your Curriculum. Patricia Staley. **CT-SG-87-20.**
Tips and information sources for teachers, with a New England focus. 8 pages.

Ordering Instructions: Send requests to:

University of Connecticut
Sea Grant Program
Avery Point
Groton, CT 06340

University of Delaware
Sea Grant Marine Advisory Service
700 Pilottown Road
Lewes, Delaware 19958
(302) 645-4346

MAS Bulletins (one copy of a single topic free; entire series $3.50).

Jellyfish: Regular Summer Visitors to Delaware Shores. Revised 1987.
Illustrated guide to four species common to the region, with life history, migratory patterns, and how jellyfish can sting.

Weakfish : Catch a Queen for Dinner. Revised 1985.
Illustrated description of the species and its habitat: includes fishing and cooking tips.

Delaware vs. the Sea: Are We Losing the Battle? Revised 1983.
Explains the activity of the sea and how coastal areas are eroded and built up. Brief description of geologists' research methods and engineers' beach protection measures.

Common Seashells of Delaware. Revised 1990.
Diagrams, photographs, and descriptions of most common seashells.

The Horseshoe Crab — A Reminder of Delaware's Past. Revised 1989.
Illustrated description, history, habits, medical uses and population trends of this colorful seashore animal.

Flounder, the Ocean's Platter. Revised 1987.
Illustrated description of various species of flounder common to Delaware coastal waters, explaining appearance, habits, fishing suggestions.

Shark.
Describes and illustrates six sharks common to the mid-Atlantic area; handling, cleaning, preserving tips, and recipes.

Delaware's Blue Crab. Revised 1984.
Describes the life history and methods for commercial and recreational crabbing. Includes recipes.

The Hard Clam. Revised 1986.
Biology and life cycle of the hard clam; recreational and commercial clamming.

The Delaware Bay Oyster and the MSX Problem.
Reports on recent findings by researchers and looks at the steps being taken by fisheries managers to prevent another outbreak of MSX disease.

The Bottle-Nosed Dolphin: Our Coastal Whale.
Reviews the dolphin's life history, biology and communication/echolocation ability. Includes a detailed list of what you should do if you encounter a stranded dolphin.

MAS Notes (1 copy of a single topic free; $1.00 for the entire series).
A series of one- or two-page fact sheets that cover a wide variety of topics. MAS Notes have become a popular way to answer questions concerning Delaware's marine environment. Topics include Beach Safety Information Sources; Beach Seining; Galvanic Corrosion; Hurricane Preparedness for Coastal Sussex County, Delaware; Marine Careers: The Oceanographer; Marine Weather Reporting; Plastic Pollution in the Marine Environment; Sharks: A Resource Guide; Guidelines for Spring Boat Refitting; Consumers: Know the Facts about Eating Raw Shellfish; Don't Cook Blue Crabs by Their Color; Eating Raw Finfish: What Are the Risks, the Benefits; Marketing Potential for East Coast Squid; Safety at the Beach; Downriggers; Fisheries Conservation Begins with You: Tips on Releasing a Hooked Fish; Guidelines for Winter Boat Lay-up; Recreational Boaters: Take Charge of Your Discharge; and Onboard Handling of Spiny Dogfish.

The Delaware Estuary: Rediscovering a Forgotten Resource ($20.00)
A full-color, 144-page review of the Delaware Estuary—its history, geology, resources and management. Chapters include History, Geology, Dynamics, Plankton, Fisheries, Tidal Marshes, Migratory Shorebirds, Human Use and Management.

Delaware's Outdoor Wonders: A Guide to Outdoor Recreation. 1986.
Published in cooperation with state and local agencies, this full-color pamphlet includes information on boating, shellfishing and fishing, with a saltwater fishing chart revealing seasons, techniques and baits for popular species.

Delaware Seafood Directory. 24 pp.
Published in cooperation with the Delaware Department of Agriculture, this publication is designed to introduce consumers to Delaware's seafood markets—their products and services. Includes Delaware fresh seafood availability chart.

University of Delaware Sea Grant Reporter. 6 pp.
This quarterly newsletter reports on the research, education and advisory activities of the University of Delaware Sea Grant College Program. Includes listing of new publications, facts on a wide variety of marine topics, and seasonal seafood recipes.

Seafood Delaware-Style. 54 pp. 1988. ($2.00)
This handbook provides pointers on how to eye, buy, store, handle and prepare Delaware seafood. Includes nutritional information and unique recipes to help you enjoy Delaware's bounty.

Seacapes II. 44 pp. 1983. ($2.00)
This booklet contains 18 articles on marine topics, including biting flies, currents, dunes, Bombay Hook, Assateague ponies, seafood, bay and river pilots, sunken treasure, and marine critters.

Coal Transfer. 8 pp. March 1984.
Can environmentally safe coal-transfer operation be undertaken in lower Delaware Bay? Delaware Estuary Situation Report.

Fisheries Fluctuations. 10 pp. May 1986.
Why have several Delaware Bay

Audio-Visuals—may be rented for up to 7 days for $5.00. A refundable $25.00 deposit is also required. (Sales price in parentheses):

Marine Careers, 35 mm slide/tape presentation ($50). Narrated slide show that describes career opportunities in marine-related professions. Length: 15 min.

Beach Safety on the Delmarva Peninsula, 35 mm slide/tape presentation ($50). Provides the unfamiliar beachgoer with an overview of natural conditions and marine life at the ocean's edge. Length: 20 min.

The Blue Crab, 35 mm slide/tape presentation ($50). Covers the natural history of the area's most famous crustacean with simple language, colorful pictures and cartoons. Targeted for elementary students, the package also includes a classroom activities booklet designed to reinforce concepts depicted in the slideshow. Length: 15 min.

Beachwalk: Exploring the Living Coast, 35 mm slide/tape presentation ($50). Introduces young students (K-3) to the marine life easily found while walking on Delaware's beaches. The basic concepts of waves, tides, salinity and sedimentation are interwoven to illustrate the uniqueness of living at the water's edge. Length: 15 min.

Marine Corrosion — The Silent Enemy, 35 mm slide/tape presentation ($50), VHS and Beta ($25). Explains what marine corrosion is and why it occurs, and offers suggestions and techniques for preventing it. Length: 15 min.

MAREP: Mariner Reports, VHS and Beta ($25). Highlights the Mariner Reports program sponsored by the National Weather Service and the University of Delaware and provides information on how boaters can participate in this valuable self-help approach to improving the accuracy of marine forecasts. Fisherman Ed Davis stars in the segment for commercial boaters; America's Cup yachtsman Gary Jobson stars in the segment for recreational boaters. Length: 25 min.

Shellfish and Your Microwave—The Perfect Couple, VHS and Beta, *for rental only.* Introduces viewers to the delicious and convenient alternative of microwave cooking for shellfish. From opening shellfish to defrosting them, the microwave proves a handy tool for shellfish cooks. Length: 22 min.

Ordering Instructions: Make checks payable to the University of Delaware. Mail request with check to:

University of Delaware
Marine Communications Office
263 E. Main Street
Newark, DE 19716

State University System of Florida
Sea Grant College Program
Building 803
Gainesville, Florida 32611
(904) 392-5870

Florida Marine Education Resources Bibliography. $3. **SGR-51** (March 1983).
Lists nearly 500 documents, all of which are available from the author or publisher. Subject areas include not only marine biology and oceanography, but also literature, the arts, engineering, etc. Each item is annotated with information on subject, grade level and application (e.g., laboratory, field project, etc.). Some materials are specific to unique Florida coastal and marine features, such as mangroves, but others deal with more general topics. 115 pages.

Marine Education K-12 MAP-17 (April 1982).
Provides information on finding funds and opportunities for K-12 marine education resources, courses and activities. 18 pages.

Marine Education and Research Organizations in Florida. SGEB-3 . (1991)
A compilation of educational and research organizations in Florida with programs in the marine sciences. Includes addresses, phone numbers and descriptions of facilities and programs. 86 pages.

Man Meets Coast - A Coastal Game. $3. **MAP-26.**
An educational game for 30 to 75 players who assume new identities to explore and resolve various coastal issues facing their fictitious community. For both adults and junior-senior high school students, the game proceeds from neighborhood meetings to meetings of common interest groups (e.g., fishermen, developers, conservationists, tourists, etc.) and concludes in a county commission hearing to decide policies regarding such common issues as fishing in canals, dredging of a ship channel, and coastal water supply regulations.

Man Meets Coast . MAP-11.
An illustrated cartoon booklet concerning man's attraction to the coast, the problems that result and what is being done about them. Included with the Coastal Game or available separately. 32 pages.

Fisheries Biology for Everyone. $3. **SGEB-11.** (April 1986).
Presents fisheries biology in an enjoyable and readable way, but stresses the management aspects relative to the scientific and ecological. The hand-lettered manuscript, which includes cartoon drawings emphasizing important points, brings to life information vital to any user of the living marine resources, particularly fishermen. Can also be used in senior high school level marine biology courses. 178 pages.

The Beach - A Natural Protection From the Sea. MAP-19.
Discusses the principal features of a beach that are effective in protecting the uplands, how the beach "works," the effect of littoral drift, and the function of the sand dunes. 4 pages.

Marine 4H Program Materials (available from Florida 4H Department, University of Florida).

Florida 4H Marine Science Program. 4H 314.
Projects in this annual are designed mainly for 4H leaders and members. Each project is a unique study because a simple procedure is all that is needed to fulfill its objective. Projects include both biotic (those that deal with living things) and abiotic (those that are not living such as sand and tides). The biotic factors are arranged from the lowest form of marine organism to the highest form, while the abiotic factors are placed in their respective order so that learning from one project will help in working with the next. 49 pages.

Field Study of the Marine Environment (Leader's Guide). **4H 338.**
Provides the leader with information useful in helping 4H members understand the importance of one marine ecosystem to another and, in turn, the importance of ecosystems to humans and vice versa. 18 pages.

Starting and Maintaining a Marine Aquarium. 4H 356.
Explains all about aquaria to 4H members who are interested in starting a project on saltwater aquaria, including using artificial or natural seawater, setting up the aquarium, filling it, buying the fish, feeding, cleaning, water maintenance, etc. 12 pages.

Starting and Maintaining a Marine Aquarium (Project Record). **4H 356.**
Accompanies 4H-356 for use of the 4H member in keeping a record of the project. 7 pages.

Life in the Sea (Member's Guide). **4H 358.**
Contains seven projects that can be started by visiting an oceanarium and finished through 4H Club work or individual research at home or in a library. These projects include dolphins, manatees, seals and sea lions, penguins, mollusks, Caribbean/Atlantic Coast tide pool, and coral reefs. 47 pages.

Life in the Sea (Project Record). **4H 359.**
Accompanies 4H-358 for use of the member in keeping a record of the projects. 23 pages.

Life in the Sea (Leader's Guide). **4H 360.**
Assists leaders in working with members on projects in 4H-358. Contains answers to the questions raised in 4H-358.

Intertidal Zone Project (Guide for Senior 4H Members). **4H 362.**
Intended for those who live near the ocean or for those who can visit the beach at least once a month. Explains the working of the intertidal zone and contains six activities to be conducted, including seining, plant and algae collecting, plankton collecting, measuring salinity, measuring temperature, and measuring turbidity. 76 pages.

Wetlands (Project Manual). **4H 365.**
Describes the types of wetlands—estuaries, salt marshes, swamps and mangrove wetlands—and discusses their importance to the marine life that use the wetlands as a nursery. 19 pages.

Wetlands (Project Record). **4H 366.**
Accompanies 4H-365 for use of the 4H member in maintaining a record of the wetlands projects. 11 pages.

Fins and Scales. 4H 367.
Contains descriptions and line drawings of fish, their fins and their scales. 11 pages.

The Florida 4-H Marine Education Program.
Provides a history and steps taken to establish the 4-H Marine Program in Florida. A statement of objectives, approach and results of the program effort are described. 6 pages.

Florida 4-H Department Marine Booklists.
A list of publications, sources and annotated bibliography of books found useful in the development and implementation of the Florida 4-H Marine Program. 25 pages.

Florida 4-H Marine Ecology Program—Information and Event Guidelines.
A publication describing the Marine Ecology Event with objective program organization, program contact, leader training, youth training, scheduling the event and its activities, event category and format, breaking ties, and the award program. 11 pages.

4-H Marine Resource Program Guide.
This publication describes program resource opportunities and suggests types of individual that could service a Marine Education Program. 4 pages.

The National 4-H Report Form: An Example for a Marine Science Project.
This publication describes and gives examples on how to adopt the National 4-H Report Form for use in Marine Science Projects. 19 pages.

Starting and Maintaining a Marine Aquarium: 4-H Member Project Record Book.
4H-357 Maintain project records for Booklet 4H-353, Starting and Maintaining a Marine Aquarium. 7 pages.

Ordering instructions for Sea Grant materials: Mail checks, payable to University of Florida, to:

Publications
Florida Sea Grant College Program
Bldg. 803, University of Florida
Gainesville, FL 32611

To order 4-H Marine Program materials, mail inquiry to:

Thomas Greenawalt
115 Rolfs Hall
University of Florida
Gainesville, FL 32611

University of Georgia
Sea Grant College Program
Ecology Building
Athens, Georgia 30602
(404) 542-7671

A Field Guide to Jekyll Island. Taylor Schoettle, illustrated by Carol Johnson. $5.00.
This is a comprehensive guide to a barrier island typical of many islands along the southeast coast. Physical processes of this dynamic barrier island are discussed and common plants and animals found on the beach and in the salt marsh are illustrated. For adults, teachers, and high school and college classes. 47 pages, includes booklists and references.

The Blue Crab. Produced and written by Taylor Schoettle. Video. $30.00
This 30-minute video was produced for high school audioences and the general public. It depicts the life cycle of the blue crab and discusses the economic importance of this resource. VHS format.

Gray's Reef National Marine Sanctuary: An Educational Handbook. Dr. Jay Calkins, illustrated by Carol Johnson, Edith Schmidt and Karen Roeder. $2.50.
This book describes biological, chemical and geologic processes that make this "live bottom" reef a unique and important resource. The handbook contains informational text, illustrations and classroom activities for high school/advanced middle school students interested in oceanography and marine biology. 33 pages.

The Coast of Georgia: Land, Sea and Marsh. Produced, directed and written by Dr. Jay Calkins. Video. $30.00.
This 30-minute video program was produced to give high school and middle school students and the general public an overview of the coast of Georgia. Beach processes, hydrographics and food webs of the salt marshes are all revealed in an attractive audiovisual format. Human impact and the controversial use and abuse of coastal areas is also discussed. VHS format.

Harvesting Georgia's Shrimp. Video. $15.00.
This 20-minute video program shows in detail the harvesting of shrimp on the southeast coast. Boats, gear technology and operation of a trawling vessel in search of the delicious white shrimp are all revealed. VHS format.

How Birds Make a Living on the Coast. Written and illustrated by Will Hon. $1.00.
This poster gives students and adults a graphic view of coastal birds. The text and illustrations provide the learner with a look at the anatomical adaptations that coastal birds have developed to feed in a variety of ecological niches.

Gray's Reef (Common Fishes of). David Miller and Reita Rivers, illustrated by Charlotte Ingram. $1.00.
This poster illustrates and describes the common fishes found around Gray's Reef National Marine Sanctuary. The fishes found on Gray's Reef are typical of many of the fishes found along the southeast coast, but atypical because many reef fishes of the Caribbean are also found there.

Ordering Instructions: Mail checks, payable to The University of Georgia, to:

University of Georgia Marine Extension Service
P.O. Box 13687
Savannah, GA 31416

University of Hawaii

Sea Grant Program
1000 Pope Road, MSG 200
Honolulu, Hawaii 96822
(808) 948-7031

How to Use the Library to Find Marine-Related Information. Peter J. Rappa. 4 pages. March 1984. **UNIHI-Seagrant-AB-84-02.**

Ocean Activity Workbook. University of Hawaii Sea Grant College Program. 32 pages. June 1982. **UNIHI-Seagrant-MR-82-01.**

National Survey of Fishery Education in Institutions of Higher Education. Rose T. Pfund. 48 pages, 3 appendices. May 1985. **UNIHI-Seagrant-MR-85-02.** $1.

Blue Water Marine Laboratory. 27 pages, 11 figures. August 1976. **UNIHI-Seagrant-WP-00-24.**

Makahiki Kai Festival of the Sea '78: Teacher's Guide. Jane Torikai. 76 pages. February 1978. **UNIHI-Seagrant-WP-00-30.** $1.50.

Marine Option Program Data Acquisition Project: Honolulu Bay, Maui. Leonard Torricer, et al. 38 pages, 3 figures, 11 tables, 3 plates. May 1979. **UNIHI-Seagrant-WP-00-40.**

Survey of Fishery Programs in Colleges and Universities in the United States. Rose T. Pfund. 1986. In Fisheries 11 (6): 16-21. **UNIHI-Seagrant-JC-87-01.**

Ordering Instructions: Mail checks, payable to University of Hawaii, to:

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Illinois-Indiana Sea Grant Program

University of Illinois
65 Mumford Hall
1301 W. Gregory Drive
Urbana, Illinois 61801
(217) 333-9448

Appreciating Your Great Lakes. Christine Pennisi. 96 pp. **IL-IN-SG-E-89-1.** $4.00.

A 4-H marine science guide containing suggestions for educational activities and an 82-page reference section (audiovisuals, maps/charts, computer software, and publications) to assist teachers, 4-H leaders, and youths in grades 6-12. It is divided into four units: recreation, heritage, ecology, and economics.

Ordering Instructions: Send requests, with checks payable to the University of Illinois, to the attention of Robin Goettel, at:

Illinois/Indiana Sea Grant Program
University of Illinois
65 Mumford Hall
1301 W. Gregory Drive, IL 61801

Louisiana Sea Grant
Center for Wetland Resources
Louisiana State University
Baton Rouge, Louisiana 70803-7507
(504) 388-1558

Waterborne! Louisiana's Ports and Waterways, J. Schweitzer. LSU-E-84-001, 58 pages, $5.00.
Intended as a supplement in eighth-grade Louisiana history courses, this book traces the history and development of ports and water transportation in Louisiana. Illustrations, maps, index, bibliography.

Seascope: A Marine Activity Book for Elementary Schools, J. Schweitzer, E. Coleman, L. Weber. LSU-E-82-0001, 84 pages, $6.50.
Contains ten separate study units geared to grades four through six. Subjects include the uses and nature of water, the marine environment, the ecology of Louisiana's coastal marshes, shells, behavior and eating habits in marine animals, the biology of the crawfish, and boats and boating terms. Illustrated, with games, maps and simple experiments.

Marine Science Teaching Aids (Series). 4 to 8 pages, free.
Designed for high school teachers, this series presents marine-related concepts that can be taught in typical high-school science classes and includes background information and suggested activities.

Nautical Education for Offshore Extractive Industries—Support Operations and Seamanship, G. Hoffmann.
For use in high school vocational education courses in nautical science, this text covers cargo operations, marine towing, ecology and energy, attitude, seamanship, and U.S. marine law and regulations.

Sea Turtles in Louisiana's Coastal Waters, D. Fuller, A. Tappan, M. Hester. LSU-T-87-004, 40 pages, $4.00.
Reviews the biology of the five species of sea turtles found in the Gulf of Mexico, discusses turtle mortality and preservation measures now underway and reports the results of a study of turtles in Louisiana waters.

Restless Ribbons of Sand, J. Wells, C. Peterson. LSU-T-86-004, 20 pages, free.
Describes the formation, structure and ecology of Atlantic and Gulf coastal barrier islands. Discusses the value of barriers, the impacts of man's activities on them, and management efforts such as the Coastal Barrier Resources Act. Color illustrations.

A Guide to Saltwater Aquariums, S. Ruckstuhl. LSU-H-85-001, 13 pages, free.
Describes the equipment needed for setting up a saltwater aquarium and gives instructions for setting up and maintaining the tank and choosing the appropriate animals.

Hurricanes Can Kill, S. Ruckstuhl, LSU-TL-83-003, 4 pages, free.
A hurricane safety checklist describing the precautions necessary when coping with an approaching hurricane. Available with this leaflet is a hurricane tracking chart (18" x 24") showing the Gulf and Caribbean area and describing hurricane-related terms used by the National Weather Service.

Common Vascular Plants of the Louisiana Coastal Marsh, R. Chabreck, R. Condrey. LSU-T-79-003, 120 pages, $7.00.
Contains physical descriptions and line drawings of Louisiana's common marsh plants. A map plots where they commonly occur. Alphabetized by species, the book also contains a list of plants by families, a glossary, and an index.

Ordering Instructions: If required, may check payable to Louisiana Sea Grant. East Baton Rouge Parish residents add 7% sales tax; other Louisiana residents add 4% tax.

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LSU Center for Wetland Resources
Baton Rouge, Louisiana 70803-7507

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Sea Grant Communications
30 Coburn Hall
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Connections to the Sea: A 4-H Guide to Marine Education. Compiled by Cooperative Extension Service. 57 pages. E-MSG-82-7. Free.
This guide provides basic information about the ocean and our relationship to it. Detailed marine education activities; suggested resources; and a field guide to organisms.

What Is Our Maritime Heritage? John Butzow, et al. Northern New England Marine Education Project. 33 pages. E-MSG-85-4. $5.00.
A marine education infusion unit on ships and sailing in northern New England. Each major ship type is presented as a separate section, with background information given for classroom presentation or individual reading assignments. Includes listing of multidisciplinary activities/projects.

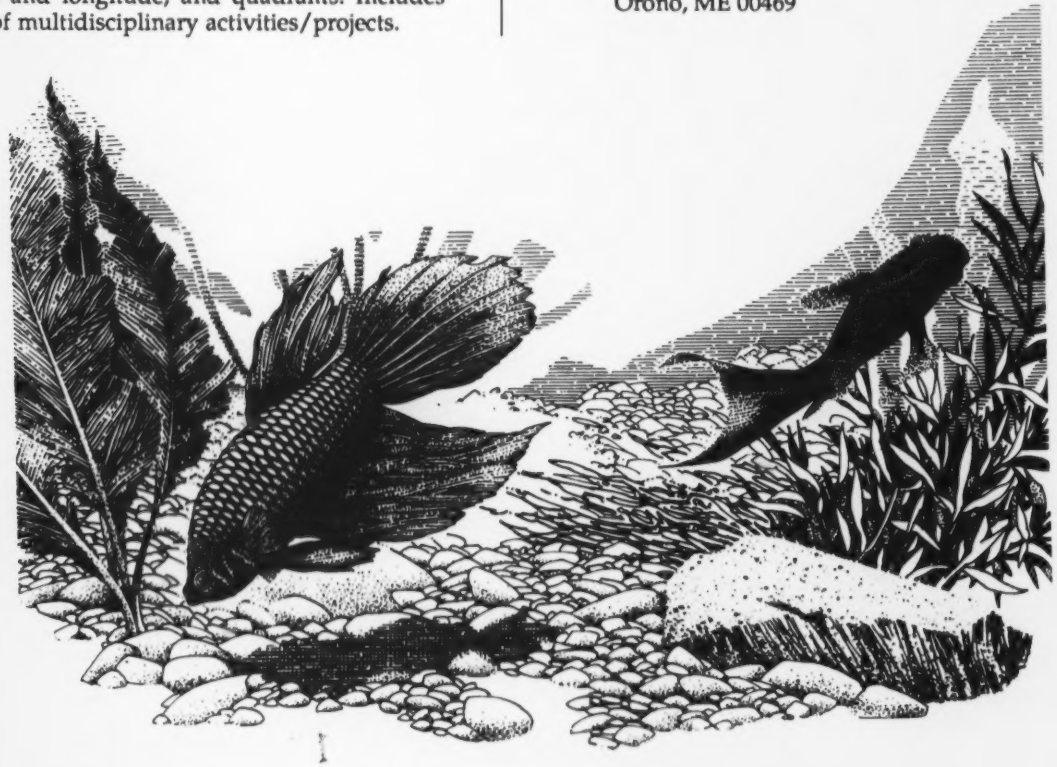
How Do People Use Lighthouses and Navigational Charts? John Butzow, et al. Northern New England Marine Education Project. 35 pages. E-MSG-84-6. $5.00.
A marine education infusion unit on navigational aids. Marine charts, nuns and other buoys, lighthouses, navigation, dead reckoning, determining latitude and longitude, and quadrants. Includes listing of multidisciplinary activities/projects.

Is Our Food Future in the Sea? John Butzow, et al. Northern New England Marine Education Project. 31 pages. E-MSG-84-8. $5.00.
A marine education infusion unit on aquaculture and sea farming. This unit focuses on the biology, economics and gastronomics of sea farming, especially of shellfish. The blue mussel, the oyster, finfish farming, the lobster, algae culture, classroom activities, teacher resources.

Do You Know Our Maritime Fishes? John Butzow, et al. Northern New England Marine Education Project. 31 pages. E-MSG-82-8. $5.00.
A marine education infusion unit on finfish in the Gulf of Maine. Classes of fish, commercial and recreational fishing, fish behavior, migrating fish, food webs, fish in the arts and crafts, shark and bony fish dissection, classroom activities, teacher resources.

Ordering Instructions: Mail check, payable to University of Maine, to:

Sea Grant Communications
University of Maine
30 Coburn Hall
Orono, ME 00469



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University of Maryland
Sea Grant Program
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College Park, Maryland 20742
(301) 454-6059

Marine Science Education Workbooks: Tides and Marshes. Jack Greer, ed. 37 pages. **UM-SG-ES-79-01.** $2.00.
The workbook is aimed at middle school/junior high school students, though teachers and group leaders may find a wider application for the materials. Each workbook contains a Teachers Narrative, a Student Activities Section and a Resource Section. Figures include diagrams of intertidal zones, tidal effects on vegetation and the moon's effect on tides.

Marine Science Education Workbooks: Food Webs in an Estuary. Jack Greer, ed. 26 pages. **UM-SG-ES-79-02.** $2.
The workbook introduces the subject of food chains and food webs, using elementary examples from an estuarine system. Although the focus is on the Chesapeake Bay, the material may be adaptable to any similar estuarine environment. Figures include diagrams of simple food chains.

Marine Science Education Workbooks: The American Oyster. Jack Greer, ed. 57 pages. **UM-SG-ES-79-03.** $2.
The American Oyster, once Maryland's most valuable seafood, serves as the subject of this workbook, a marine science mini-unit aimed at middle school/junior high school students. The workbook includes a number of figures; diagrams of oyster anatomy, salinity charts, harvest graphs and charts showing the location of oyster bars and the range of oyster predators. There are also pictures of harvesting devices and descriptions of the Chesapeake Bay oyster fishery.

Decision Making and the Chesapeake Bay. Emmett L. Wright. 220 pages. **UM-SG-ES-85-01.** $14.95. 1985.
This curriculum unit focuses on the Chesapeake Bay as both a political and ecological watershed. Aimed primarily at high school science or social studies classes, it provides a significant amount of information about the Chesapeake Bay, while involving students in a simulated decision-making process.

Ordering Instructions: Please make checks payable to University of Maryland. Send request with check to:

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University of Maryland
Sea Grant Program
1224 H.J. Patterson Hall
College Park, MD 20742

Massachusetts Institute of Technology
Sea Grant College Program
Room E38-302
77 Massachusetts Avenue
Cambridge, Massachusetts 02139
(617) 253-7041

Citizen's Guide to Sources for Marine and Coastal Information in Massachusetts. 5th edition compiled by Madeleine Hall-Arber and edited by Karen Hartley. MITSG 90-3. $5.00.

This guide lists more than 170 Massachusetts agencies, information centers and organizations concerned with and important to marine and coastal affairs. Arranged alphabetically, each entry includes office hours, address and telephone numbers, as well as a brief description of the objectives, specialties, services, education materials, fees, newsletters and contact names of each organization. A subject index provides easy interest group reference.

Marpol Annex V: no more dumping plastics in the ocean. MITSG 89-11. Free.

A new international law, known as MARPOL (short for marine pollution) Annex V, went into effect Jan. 1, 1989, to cope with the severe environmental damage caused by plastics in the ocean. MARPOL Annex V, part of the International Convention for the Prevention of Pollution from Ships, prohibits ocean dumping of plastics and greatly restricts dumping of other types of garbage. The MIT Sea Grant Program has prepared two informative brochures on MARPOL Annex V—one advises citizens of their responsibilities under the law; the other is addressed to marine operators. Please indicate which brochure you want when ordering.

Ordering Instructions: Address requests to:

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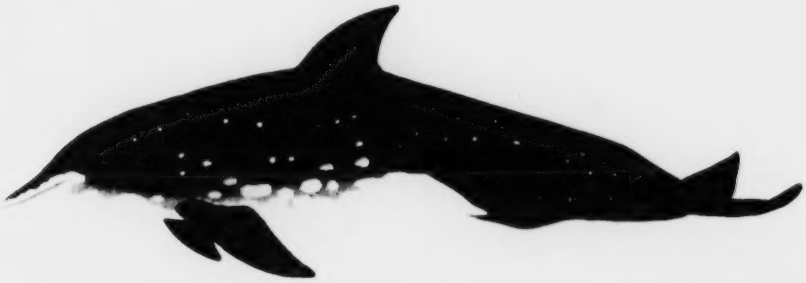

Michigan Sea Grant College Program

2200 Bonisteel Boulevard
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(313) 764-1138

Great Lakes Fishing in Transition Curriculum Unit. Paul Nowak, Leslie Lin and William Stapp, et al. **MICHU-SG-83-400.** $37.50 + $1.50 for sales tax.
The unit teaches concepts in social science, illustrating how changes in Great Lakes fish populations, caused by the sea lamprey, overfishing, and pollution, have brought about social change. One filmstrip explores the history on the Great Lakes, another explores the role of pollution in altering the Great Lakes environment. Students learn how fish are processed and cooked, how to sample and analyze stream water quality, and they take part in a mock native American fishing rights courtroom trial. Filmstrips are also available separately.

Great Lakes Fact Sheets. MSU Bulletin Office. 25 cents each; $1 per set of 6. Single copies free to Michigan residents.
Map-fold fact sheets, poster map on the back of each sheet. Facts about geography, water use, land and shoreline use, economic importance, points of interest.

Great Lakes Basin	E-1865
Lake Superior	E-1866
Lake Michigan	E-1867
Lake Huron	E-1868
Lake Erie	E-1869
Lake Ontario	E-1870

Superior Today. Michigan Sea Grant Extension, 334 Natural Resources Building, Michigan State University, East Lansing, MI 48824-1222, and WNMU-TV, Northern Michigan University, Marquette, MI 49855. 1985. **MICHU-SG-86-400.** Videotape: 3/4" $35.00; 1/2" $25.00.
An award-winning 30-minute documentary that explores the greatest of the Great Lakes—its physical dimensions and characteristics, formation and history, climate and weather, creatures, utilization, pollution, economic development.

The Trouble With Toxics. Michigan Sea Grant Extension, 334 Natural Resources Bulding, Michigan State University, East Lansing, Mich. 48824-1222. 1987. **MICHU-SG-87-401.** Videotape: 3/4" $75.00; 1/2" $35.00.
This 30-minute documentary presents the challenge of dealing with the hundreds of contaminants in the Great Lakes with information about sources of toxic substances, their chronic effects, fate and control, management of fisheries, public policy and prevention strategies.

What You Can Do for Cold Water Near-Drowning. Dive Rescue Inc./International, 2619 Canton Ct., Fort Collins, CO 80525. 1979. $49.95. 20-min slide/tape program.
With persistent resuscitation efforts, individuals, particularly children, immersed for up to 45 minutes in cold water have recovered with no after effects. This program explains what happens to the body in cold water that enables it to survive and emphasizes the importance of cardio-pulmonary resuscitation (CPR) when the victim is pulled from the water.

Waterproof Your Family: Survival Strategies Start With You. Dive Rescue Inc./International, 2619 Canton Ct., Fort Collins, CO 80525 and Michigan Sea Grant College Program. 1987. $249.95. 28-page program guide, 20-min slide/tape show, 75-min VHS, 10 posters, 100 handouts.
Easy-to-use program focuses on accident survival skills for all ages. In classroom and pool sessions, swimmers and non-swimmers learn how to handle an unexpected immersion. With preparation, practice and a positive attitude, most drownings can be avoided.

Fishes of Isle Royale. K. Lagler and C.R. Goldman. Isle Royale Natural History Association, 87 N. Ripley, Houghton, MI 49931. 1982. $4.45 plus $1.08 for sales tax and handling.
Covers the history of Isle Royale, origins of fishes, descriptions and illustrations to identify the fishes of Isle Royale.

Cold-Water Drowning: A New Lease on Life. Martin Nemiroff and U.S. Coast Guard. 1977. **MICHU-SG-77-104.**
Detailed information on the steps to take to rescue a victim in a cold-water drowning emergency. Includes graphics depicting rescue techniques.

Fall Beachcombing. Suzanne Tainter. 1978. **MICHU-SG-78-305.**
Describes the natural treasures that can be found on Great Lakes beaches including rocks, plants and animals.

Cold Water Survival—Hypothermia. Stephen Stewart and Sue Tainter. 1980. **MICHU-SG-80-513.**
Brief descriptions of hypothermia, first aid for the hypothermia victim, and hypothermia prevention.

Fish in Lake Michigan: Distribution of Selected Species. Larry Sommers, et al. 1981. **MICHU-SG-81-600.**
Explains the natural and human factors which influence fish distribution. Includes full-color maps of species distribution, and of Lake Michigan bathymetry, currents, temperature, and other features.

Shoreline Erosion: Questions and Answers. 1985. **MICHU-SG-85-511.** $0.50.
Contains answers to questions frequently asked by shoreline property owners about erosion, structures, permits, laws, costs and contractors.

Diver Education Series: Introduction to Scuba Diving. Lee Somers. 1986. **MICHU-SG-86-504.** $1.25.
Are you interested in scuba diving, but not sure what you might be getting into? How can you choose a good scuba training course? Answers to these and other questions.

Diver Education Series: Oceanography for Divers: Waves, Ties and Currents. Lee Somers. 1986. **MICHU-SG-86-508.** $1.00.
To dive safely, the diver must have a working knowledge of waves, tides, currents and water quality. This paper provides the diver with a general understanding of the physical characteristics common to lakes and oceans. Diving techniques are described to give the diver a better understanding of how to dive under various conditions.

Diver Education Series: Oceanography for Divers: Hazardous Marine Life. Lee Somers. 1986. **MICHU-SG-86-510.** $2.00.
The life of the marine environment is beautiful and fascinating, and relatively few marine plants and animals are hazardous to the dive. This paper will help the diver recognize organisms that can inflict injury, describe how to avoid injury, and the proper first aid for the different types of injuries inflicted by marine organisms.

Great Lakes Fish Preparation. MSU Bulletin Office, 1978 (reprinted 1982), **E-1179.** 50 cents.
This well-illustrated bulletin describes proper handling of freshly caught or purchased fish, and offers tips for different cooking methods, including a fish cooking chart and recipes for breadings, toppings, batters, liquids, seasonings and sauces, and soups.

Freshwater Fish Preservation. MSU Bulletin Office. 1978. (revised 1980; reprinted 1986). **E-1180.** 65 cents.
This bulletin explains several techniques for preserving fish from the Great Lakes and other freshwater lakes and streams. Included are freezing, canning, smoking, salting and pickling.

Scientific Marine Careers. MSU Bulletin Office. 1979. **E-1355.** 30 cents.
Describes various types of scientific marine careers in the fields of biology, chemistry, geology, physical science, environment, social science and general science.

Professional Marine Careers. MSU Bulletin Office. 1979. **E-1356.** 30 cents.
Describes various types of professional marine careers in the fields of environmental affairs, business and industry, consultation and education, engineering, merchant marine, fine arts, government and general occupations.

Technical Marine Careers. MSU Bulletin Office. 1979. **E-1357.** 30 cents.
Describes various types of technical marine careers in the fields of ship/boat building and repair, merchant marine, commercial fishing, offshore mining and petroleum operations, port activity and maintenance, marina and marine dealer.

Eating Great Lakes Fish. MSU Bulletin Office. 1987. **E-2028.** 25 cents.
Provides current answers to questions about possible contamination of fish from the Great Lakes, includes diagrams for cleaning and cooking fish to minimize exposure to possible contaminants.

Lightning & Boats. 1989. **MICHU-SG-89-700.** $0.50; 10 or more $0.25.
Boats are vulnerable to lightning strikes because they are often the highest point in the area and become targets for lightning seeking a path to the ground. This pamphlet describes a lightning protection system for boats. First aid for victims of lightning strikes and advice on protecting the boat's electronic equipment are included.

Ordering Instructions: Publications with no price given are free. Except where noted, mail check, payable to Michigan Sea Grant, to:

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Minnesota Sea Grant College Program

University of Minnesota
1518 Cleveland Ave. N.
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Edge of the Arrowhead. R. Lydecker, 1982. 60 pp. $2.
Provides thumbnail sketches of the history of Minnesota's North Shore.

A Family Guide to Minnesota's North Shore. N. Hereid, E. Gennaro, 1983, 1986. 42 pp. $3.95.
Activities for the whole family, drawing attention to the historic, scenic, and geological aspects of the 200-mile stretch along Lake Superior.

Hypothermia: the Cold Facts. $30 to rent; $60 to buy.
This is a new videotape that explains current research on hypothermia, how to prevent hypothermia, and how to increase your chances of survival in cold water. The half-four program is presented in a non-technical feature format. It is suitable for hunters, anglers, youth groups, medical personnel and anyone who plays or works near cold water. **Rent or buy from:** Minnesota Sea Grant College Program.

Lake Superior Game: Use Versus Abuse. B. Liukkonen. Free.
Teaches students how to balance decisions related to water pollution, personal values and regional economics. The game can be adapted to any lake and is most appropriate for upper elementary and secondary students.

Gulliver the Talking Gull. $60 handling fee, $20 per day, plus shipping.
An interactive animal for education and entertainment, Gulliver stands about three feet tall in front of a blue wave of water. His eyes light up and his mouth moves in sync with the person's voice who speaks for him. His wings flag up and down, his head moves from side to side, and his body tilts forward to speak to children. Scripts are provided on environmental issues and gulls.

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University of Minnesota
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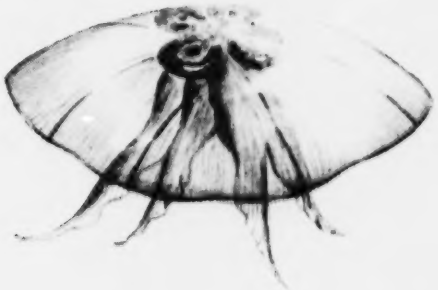
St. Paul, MN 55108



Mississippi-Alabama Sea Grant Consortium

Caylor Building
Gulf Coast Research Lab
Ocean Springs, Mississippi 39564
(601) 875-9341

Birds and Birding on the Mississippi Coast. MASGP-86-031. $17.95 ***(Order from University Press of Mississippi, 3825 Ridgewood Road, Jackson, MS 39211.)***
This book contains three primary sections. Section one contains general information on the Mississippi coastal zone, including the barrier islands. Section two provides specific information on approximately 360 species of birds to include breeding, abundance, distribution, dates of occurrence, and the best areas for observation. Section three contains site guides.

Buying and Preparing Blue Crabs. MASGP-85-015. Free.
This brochure gives step-by-step instructions for purchasing and preparing blue crabs. Illustrations are included.

Buying and Preparing Fish. MASGP-86-006. Free.
This handy guide on buying and preparing fish includes a health and nutrition chart, quality and freshness table, and illustrated directions for filleting.

Buying and Preparing Oysters. MASGP-84-003. Free.
This brochure provides laymen with advice on handling oysters, characteristics to look for when purchasing oysters, as well as a discussion on preparation.

First Aid for Damaged Beaches and Dunes. MASGP-81-011. Free.
This brochure contains a four-step plan for Mississippi and Alabama shoreline-property owners to aid in the restoration of damaged beaches and dunes.

Flounders and Floundering. MASGP-74-023. Free.
This pamphlet reveals tips concerning the "right" equipment to use in landing a flounder.

Guide to Common Tidal Marsh Invertebrates of the Northeastern Gulf of Mexico. MASGP-70-004. $8.
This 82-page book fulfills a need in the literature by providing a well-illustrated, up-to-date identification guide for marine macroinvertebrates that live or occur in the salt marshes along the Mississippi-Alabama coast and immediately adjacent areas of Florida and Louisiana.

How to Find Marine Information in Public and School Libraries. MASGP-77-013. (Reprinted with permission from Marine Advisory Service, University of Rhode Island.) Free.
This five-page booklet provides ten basic steps for the reader to use in finding information from various types of libraries.

Hypothermia. MASGP-86-015. Free.
Illustrated directions outline steps to take if an individual is unfortunate enough to fall overboard and experience a rapid and life-threatening loss of body heat.

The Jubilee Phenomenon. MASGP-88-017. Free.
This pamphlet gives an overview of the basic cause of jubilees, the conditions that favor their occurrence, and observations associated with them.

Man and the Gulf of Mexico Educational Series. MASGP-82-007. ***Available from University Press of Mississippi, 3825 Ridgewood Road, Jackson, MS 39211.***
This series is composed of four paperback books that can be used individually or as a set. Each is a textbook-workbook with general and specific objectives for each unit, vocabulary exercises, diagrams, many illustrations, and instructions for experiments. The series can be used as textbooks for marine science courses, as supplements for introductory biology courses, or as library reference books.

Marine and Estuarine Ecology, Volume 1, 88 pages, illustrated. $5.00.
An introduction to fundamental concepts and the vocabulary needed for understanding the ecology of marine environments, this volume emphasizes the diversity and dynamics and demonstrates the interdependency of living organisms. Plankton, nekton, intertidal and coastal organisms, and coastal habitats are given careful examination. Special attention is given to instructing students in recording data accurately and logically and in making sound generalizations. This volume also acquaints students with basic equipment for studying marine life.

Marine Habitats, Volume 2, 88 pages, illustrated. $5.00.
This text introduces five marine habitats—salt marsh, mud flat, sound, beach and the barrier island—and presents general information about the organisms that live in each. It emphasizes the interdependency of plants and animals and compares and contrasts the manner in which these organisms adapt themselves to their habitats.

Diversity of Marine Plants, Volume 3, 135 pages, illustrated. $6.00.
This volume explains the biological classification system and the process of photosynthesis. Eleven

experiments investigate seven types of algae, marine bacteria, sea grasses, and salt marsh plants.

Marine Animals, Volume 4, 126 pages, illustrated. $6.00.
This book introduces the physical characteristics, the behavior, and the natural environment of a variety of marine animals. Included are protozoans, sponges, coelenterates, ctenophores, polychaetes (marine annelids), mollusks, echinoderms, marine crustaceans (barnacles, blue crabs, hermit crabs, shrimp and horseshoe crabs), sea squirts and tunicates, sharks and stingrays (cartilaginous fish), seashore birds, marine turtles, and marine mammals. This volume includes extensive illustrations and offers students fifteen activities for identifying and learning about marine animals and their adaptive behavior.

Mississippi Marine Resources—Pilot Manual. MASGP-81-002. Free.
This 16-page, illustrated manual provides an overview of both marine and fresh water including planktonic forms and dunes and vegetation. There are ten concepts and/or activities that would be applicable for middle and secondary students.

Oysters in Alabama. MASGP-85-011. Free.
This brochure reviews the biology, environment and management of the commercially important species, *Crassostrea virginica.*

A Pictorial Guide to Common Demersal Fishes in the Gulf of Mexico. MASGP-86-009. $3.50. ***Order from Alabama Sea Grant Advisory Service, 3940 Government Blvd. No.5, Mobile, Alabama, 36609.*** (Make checks payable to the Alabama Cooperative Extension Service.)
Since fishery biologists along with commercial and recreational fishermen are exploring and exploiting the deeper waters of the Gulf of Mexico more than even, this 96-page pictorial guide is a "first step" in making these deepwater fish better known. This guide identifies fish from 100 to 600 fathoms.

Shrimp in Alabama. MASGP-86-012. Free.
This pamphlet gives a summary of the penaeid shrimp landed in coastal Alabama waters from a commercial, biological and management viewpoint.

Speckled Seatrout in Alabama. MASGP-86-013. Free.
This brochure provides an overview of the biology, fishing success and management of the speckled seatrout in coastal Alabama.

Starting and Maintaining a Marine Aquarium. MASGP-81-001. Free.
This 23-page booklet outlines the basic steps in establishing a saltwater aquarium. Detailed instructions are given on the materials needed, food preferences, artificial seawater, filter systems, suggested animal combinations, water maintenance and potential problems.

Newsletters—The following are available, free of charge at the present time. Please order from the addresses listed.
Force Five—Mississippi-Alabama Sea Grant Consortium, P.O. Box 7000, Ocean Springs, MS 39564-7000.

Gulf Coast Fisherman—Mississippi Sea Grant Advisory Service, 4646 West Beach Blvd., Suite 1-E, Biloxi, MS 39531.

Sea Harvest News—Seafood Report—Alabama Sea Grant Advisory Service, 3940 Government Blvd., No.5, Mobile, AL 36609.

The Skimmer—University of Southern Mississippi, Department of Science Education, Southern Station, Box 5087, Hattiesburg, MS 39406-5087.

Water Log—Mississippi-Alabama Sea Grant Legal Program, Mississippi Law Research Institute, The University of Mississippi, Box 20, University, MS 38677.

Blue Crabs in Alabama. MASGP-86-004. Free.
This brief, easy-to-read brochure provides information on identification, biology and management of blue crabs in Alabama. Soft shell blue crab production is also described.

Coastal Wetlands of Alabama. MASGP-88-012. Free.
This brochure includes explanations about what constitutes wetlands, the extent of Alabama wetlands, their value and measures to protect them.

Marine Fishery Management: The Regulatory Process. MASGP-87-003. Free.
This brochure explains state and federal laws and regulatory processes that affect fishermen and fishing in Alabama.

Red Drum in Alabama. MASGP-87-015. Free.
This brochure provides information on the biology, management and value of the popular "redfish" or red drum.

Royal Red Shrimp. MASGP-87-017. Free.
This pamphlet describes the deepwater royal red shrimp and tips for storing and preparing this seasonal marine species.

Saving Your Catch. MASGP-87-001. Free.
This brochure is a guide to handling and preserving seafood from the water to the table.

Soft Shell Blue Crabs. MASGP-88-006. Free.
This brochure explains what a soft shell is, what to look for when buying soft shells and how to clean and prepare them.

Ordering Instructions: Except where otherwise noted, order publications from:

Mississippi-Alabama Sea Grant Consortium
P.O. Box 7000
Ocean Springs, MS 39564-7000

University of New Hampshire Sea Grant Extension Program

Kingman Farm
Durham, New Hampshire, 03824-3512
(603) 749-1565

Alone on the Shore: A Survival Kit for Educators. Julia Steed Mawson. $10.00
A packet containing information about planning your day with your class at the shore, suggested activities and games, a small field guide to organisms and a "yellow pages" of marine education resources in the region.

Day of the Coast Celebration. Sharon Meeker. 15 pages. $1.00.
How to plan a stimulating all-school day of marine activities involving volunteers, people from the community and the teachers and students.

UN Floating Lab Resource Manual. Michael Brody and Sharon Meeker. 207 pages. $19.00. UNHMP-AR-SG-83-3. Rev. 1988.
An oceanographic curriculum focused on the New England coast, but readily adaptable to other regions.

Coastal Issues: A Wave of Concern. Julia Steed Mawson and Linda J. Maxson. 107 pages. $15.00. Trial Edition.
An interactive curriculum on issues affecting coastal areas, with a variety of activities for high school students.

Through the Looking Glass Teachers' Guide. Julia Steed Mawson and others. 61 pages. $6.50. UNH-SG-AB-115.
Curriculum for marine awareness that features the rocky shores of the Northeast. (Intended for grades 1-8.)

Waves Across New Hampshire: Evaluation of 10 Years of Sea Grant Sponsored Marine Education. Sharon Meeker. 20 pages. $3.00. UNHMP-AR-SG-87-14.
A survey of three marine education programs, and a comparison between teaching of marine science in 1976 and 1987.

Anadromous Fish of the Northeast. $5.00.
This five-color poster provides basic information on anadromous fish as well as specific information on and illustrations of five species.

Options for the Future: A Guide to Coastal Resource Management. $15.00.
This 26-minute videotape covers a range of coastal issues, explains that change is inevitable and suggests that everyone with an interest in the coastal zone needs to be involved in the process.

The Great Bay, A Living Laboratory. Trial Edition. $19.00. Sharon Meeker.
A field-based curriculum featuring onshore and offshore components for grades 7-12. 1990.

The Great Bay Watch. Trial Edition. $8.00.
A manual for citizen water monitoring groups. 1990.

Three 1/2-hour slide-script programs. $75.00 each.
The Great Bay: New Hampshire's Treasure

Salt Marshes: Nurseries of the Sea

The Great Bay Research Reserve

Ordering Instructions: Mail check or money order, if required, to:

Sea Grant Extension Program
Kingman Farm
University of New Hampshire
Durham, NH 03824-3512

New Jersey Sea Grant College Program
New Jersey Marine Sciences Consortium
Building 22
Fort Hancock, New Jersey 07732
(201) 872-1300

Where the Land Meets the Sea Exploring a Coast Activity Book and Teacher's Guide 3-4 Grade. A. Galli and S. Levine. **NJSG-83-103.**

Where the Land Meets the Sea Exploring a Coast Activity Book and Teachers's Guide, 5-6 Grade. A. Galli. **NJSG-83-104.**

Ordering Instructions: For information regarding the two publications listed above, contact:

Karen Barge
The Wetlands Institute
Stone Harbor Blvd.
Stone Harbor, NJ 08247

Marine Cuisine Series. G. Flimlin, K. Kosko and C. Teller. **NJSG-MC-No.1-6.** Free.
Single-page seafood fact sheets, highlighting local species finfish and shellfish facts and locally developed recipes.

NJ-4-H Marine Science Project. BJ Jesuncosky. **NJSG-87-151.** 248 pages. $10.00.
A comprehensive manual and activity guide for incorporating marine science curriculum and activities for youth organizations and classrooms. Revised 2nd edition with extensive bibliography.

Sea Note Series. J.A. Tiedemann. **NJSG-SN-No. 1-9.** Free.
One-page recreational bulletins featuring a diversity of topics on boating, birding, fishing and environmental conservation activities related to marine recreation.

The Great Garbage Chase. L. Iozzi. 9 min. VHS. $9.95. **NJSG-89-210 (AV).**
This short cartoon program (formerly on filmstrip but transferred to 1/2" VHS w/soundtrack) is designed to help elementary students understand the impact of marine pollution. Cost includes tape and manual.

Ordering Instructions: If applicable, make check or money order payable to New Jersey Marine Sciences Consortium. Mail requests to:

New Jersey Marine Science Consortium
Building 22
Fort Hancock, NJ 07732

BEST COPY AVAILABLE

New York Sea Grant Institute
State University of New York and Cornell University
Dutchess Hall
SUNY at Stony Brook
Stony Brook, New York 11794-5001
(516) 632-6905

Aquatic Activities for Youth.
A growing interest in aquatic science has prompted the development of these educational materials consisting of eight units designed to meet diverse educational needs. Among the subjects covered are: creating a saltwater world in a jar, raising earthworms, fish aquariums, and entomology and water. The activities can be done by special-interest clubs or school clubs, or in school science lessons.

Coastal Educator's News.
Bimonthly newsletter. Intended for all teachers dealing with coastal topics, this newsletter is published bimonthly during the school year and once in the summer. Focus is on lesson ideas, programs and corresponding dates related to coastal education.

Coastlines.
Quarterly newsletter. Contains information concerning research, education and extension activities in New York State.

Sea Grant Graduates: A Resource for the Nation. 4 pages.
Reprinted from Marine Technology Society Journal, 1983. This article explores the benefits of the National Sea Grant College Program.

Long Island Sound Study Fact Sheets

Arnold, Chester L. February 1988. **Hypoxia in Long Island Sound**. Long Island Sound Study Fact Sheet #1. Connecticut Sea Grant Marine Advisory Program. 2 pp. **CT-SG-88-02.**

Arnold, Chester L. November 1988. **Modeling Long Island Sound**. Long Island Sound Study Fact Sheet #2. Connecticut Sea Grant Marine Advisory Program. 2 pp. **CT-SG-88-08.**

Beristain, Melissa. April 1989. **Wastewater Treatment**. Long Island Sound Study Fact Sheet #3. New York Sea Grant Extension Program and Connecticut Sea Grant Marine Advisory Program. 4 pp.

Rhodes, Kathleen. July 1989. **The LISS: A Profile**. Long Island Sound Study Fact Sheet #4. Connecticut Sea Grant Marine Advisory Program and New York Sea Grant Extension Program. 4 pp. **CT-SG-89-03.**

Arnold, Chester L. July 1989. **Supporting the Sound**. Long Island Sound Study Fact Sheet #5. Connecticut Sea Grant Marine Advisory Program and New York Sea Grant Extension Program. 2 pp.

Rhodes, Kathleen. July 1989. **Priority Action Plan Demonstration Projects**. Long Island Sound Study Fact Sheet #6. Connecticut Sea Grant Marine Advisory Program and New York Sea Grant Extension Program. 2 pp. **CT-SG-89-05.**

Beristain, Melissa. June 1989. **Nonpoint Source Pollution in Long Island Sound**. Long Island Sound Study Fact Sheet #7. New York Sea Grant Extension Program and Connecticut Sea Grant Marine Advisory Program. 4 pp.

Arnold, Chester L. August 1989. **Floatable Debris**. Long Island Sound Study Fact Sheet #8. Connecticut Sea Grant Marine Advisory Program and New York Sea Grant Extension Program. 4 pp.

Gall, Ken, and Melissa Beristain. February 1990. **Seafood Issues**. Long Island Sound Study Fact Sheet #9. New York Sea Grant Extension Program and Connecticut Sea Grant Marine Advisory Program. 4 pp.

A poster and the LISS annual reports for 1986-1988 are also available.

Ordering Instructions: Mail requests for publications to:

Publications
New York Sea Grant Institute
Dutchess Hall
SUNY at Stony Brook
Stony Brook, NY 11794-5001

University of North Carolina Sea Grant Program
Box 8605
Raleigh, NC 27695-8605
(919) 737-2454

Sea Shells Common to North Carolina. Hugh J. Porter and Jim Tyler. 36 pages. $1.50. **UNC-SG-72-09.**
An illustrated guide to the state's shells.

A Guide to Soft Shell Crabbing. Wayne Wescott. 32 illustrated pages. $3. **UNC-SG-84-01.**
Instructs laymen on blue crab biology, identifying and handling peelers, harvest and shedding methods, and more.

A Guide to Salt Marsh Plants Common to North Carolina. Elizabeth Jean Wilson. 32 pages. $1.50. **UNC-SG-81-04.**
A teaching guide to the herbs, vines, grasses and shrubs found in North Carolina marshes.

Estuarine Shoreline Erosion in North Carolina. Stan Riggs, Mike O'Conner, Vince Bellis and Tony Duque. 23" X 35" posters. Please specify which posters you want. No number. $2.00 each.
A series of three colorful posters depicting erosion in the state's major estuaries; **Albemarle Sound** and **Neuse River**, and the last poster, **Cause and Effect**, explains the reasons for estuarine erosion.

Beached Marine Mammals. 2 pages. Free. **UNC-SG-BP-84-2.**
This brochure tells the step-by-step procedure for handling a stranded or dead sea mammal.

The Hardbottoms of Onslow Bay - Map. 39" X 27" posters. $5. **UNC-SG-86-25.**
These hardbottoms are pinpointed on a map. The flip side of this poster features five attractive, four-color paintings of the underwater reefs and the flora and fauna they attract. This side of the poster makes an excellent educational tool for teachers and students. The realistic paintings can provide endless classroom discussion of offshore geology, underwater habitats and species identification.

A Guide to Ocean Dune Plants Common to North Carolina. El Jean Kraus. $4.50. **UNC-SG-87-01.**
A handy field guide and resource book on the plants that grow on ocean dunes. Contains more than 50 detailed illustrations of trees, shrubs, vines, herbs and grasses.

Coastal Capers: A Marine Education Primer. Lundie Spence and Vivian Barbee Coxe. $3.50. **UNC-SG-84-05.**
This provides activities that primary grade and exceptional education teachers can use to introduce

and explain the marine environment. The activities will sharpen student skills in science, math, language arts, social studies and art. Illustrated.

Ripples. UNC-SG-90-02. 40 pages; Free (include $1 for postage and handling).
An elementary activity guide to teach children about litter in our waterways and the problems it causes. Addresses wildlife entanglement and recycling. Contains 16 illustrated acativities, including active games, puzzles and projects.

North Carolina Marine Education Manuals. Lundie Mauldin, Dirk Frankenbery and Johanna Bazzolo. These four manuals are designed to assist educators, particularly middle-grade science and social studies teachers. They present the coast as a setting and subject for study. Each manual has a similar format. Marine concepts are presented as background reading suitable for educators or secondary students. Activities and laboratory exercises provide students with hands-on experiences. Additional resources, films and references are listed.

Unit One, Coastal Geology. 108 pages. Illustrated. $2.00. **UNC-SG-78-14A.**

Unit Two, Seawater. 76 pages. Illustrated. $2.00. **UNC-SG-78-14B.**

Unit Three, Coastal Ecology. 100 pages. Illustrated. $2.00. **UNC-SG-78-14C.**

Unit Four, Coastal Beginnings. 175 pages. Illustrated. $2.00. **UNC-SG-78-14E.**

Connections: Guide to Marine Resources, Living marine Systems and Coastal Field Trips. L. Spence and J. Medlicott. 93 pages. Illustrated. $2.00. **UNC-SG-84-05.**

Includes how to set up and use brackish water and marine aquariums. Describes the state's marine resources and North Carolina field trip sites. Provides information on how to plan a field trip with an understanding of the legal responsibilities.

SEA Lab: Science Experiments and Activities. UNC-SG-90-1; $10,plus $2 postage. Discounts available on orders of over 10 copies.

Marine science for high school students in chemistry, biology and physics, physical science and oceanography. This 208-page curriculum reflects research findings in basic science concepts.

NC Coastal Plains: A Geologic and Environmental Perspective. 1/2" VHS, $30.00. **UNC-SG-89-02.**

Eight-part program running from 8 1/2 minutes to 17 minutes presenting major geologic and environmental concepts that formed the coastal plain and continental shelf and the various layers of sedimentary materials. The 1 3/4 hour video comes with student activity guide, script and supplementary background information.

Fishing for a New Catch. $12.00. 1990.

A 27-minute video documentary on underutilized fish, perceptions of fishermen, handling, cleaning and preparation. Useful for fishing clubs, youth groups and enrichment for lessons in marine occupations and home economics.

Pass It On. 1990. $12.00.

This 30-minute video presents the techniques and rationale of how to catch and release fish. Mark Sosin, a recreational fishing expert, explains how to release both large and small marine fish without harming them or the fisherman. Useful for fishing clubs, youth groups and enrichment for lessons concerning environmental ethics.

Ordering Instructions: Make checks payable to University of North Carolina Sea Grant. Send requests and checks to:

Marine Education Specialist
University of North Carolina Sea Grant College Program
Box 8605
University of North Carolina
Raleigh, NC 27695-8605

Ohio Sea Grant College Program
Ohio State University
1314 Kinnear Road
Columbus, OH 43212-1194
(614) 292-8949

Oceanic Education Activities for Great Lakes Schools (OEAGLS)

Results of studies of student knowledge about the oceans and Great lakes environments indicate a need for greater awareness of those environments and a greater understanding of the impact they have on the lives of people in the Midwest. OEAGLS (pronounced "eagles") are designed to take a concept or idea from the existing school curriculum and develop it in an oceanic and Great Lakes context, using teaching approaches and materials appropriate for children in grades five through nine. OEAGLS materials are designed to be easily integrated into existing curricula. Investigations are characterized by subject matter compatibility with existing curriculum topics; short activities lasting from one to three classes; minimal preparation time; minimal equipment needs; standard page size for easy duplication; student workbook plus teacher guide; suggested extension activities for further information or creative expression; teachability demonstrated by use in middle school classrooms and content accuracy assured by critical reviewers. Each title listed below consists of a student workbook and a teacher guide and costs $3.00 for the publication, postage and handling.

In publication numbers, S = student workbook, T = teacher guide.

The Effect of The Great Lakes on Temperature. J.D. Meinke, B.A. Kennedy and R.W. Fortner. Revised 1988. **OHSU-EP-001/S,** 9 pages, and **OHSU-EP-001/T,** 12 pages. $3.00.
Differences in heat absorption and release by soil and water show how lakes and oceans moderate land temperatures. Laboratory and map activities. Science, geography.

The Effect of Lake Erie on Climate. J.D. Meinke, B.A. Kennedy and V.J. Mayer. **OHSU-EP-002/S.** 3 pages, and **OHSU-EP-002/T,** 9 pages, 1987. $3.00.
Effect of temperature on movement of air; land and sea breezes and how they influence climate and economy near large bodies of water. Demonstration and graphing activities. Science and geography.

Ancient Shores of Lake Erie. J. Comienski and V.J. Mayer. Revised 1988. **OHSU-EP-003/S,** 7 pages, and **OHSU-EP-003/T,** 12 pages. $3.00.
Beach ridges along the lake are evidence of former lake levels related to glaciation. Characteristics of ridges make them valuable for human uses. Map study. Science, geography, history.

How to Protect a River. D.L. Hyatt, B.A. Kennedy and V.J. Mayer. Revised 1988. **OHSU-EP-004/S,** 8 pages, and **OHSU-EP-004/T,** 8 pages. $3.00.
River characteristics are compared with standards for water quality and development. A decision is made about classifying the river as wild, scenic or recreational. Map study, data usage. Science, social studies.

Changing Lake Levels. C. Farnsworth and V.J. Mayer. Revised 1989. **OHSU-EP-005/S,** 9 pages, and **OHSU-EP-005/T,** 9 pages. $3.00.
Causes and effects of lake level fluctuations lead to a study of problems involved in regulating lake levels. Laboratory and graph interpretation. Science, social studies.

Erosion Along The Great Lakes. B.A. Kennedy and R.W. Fortner. Revised 1985. **OHSU-EP-006/S,** 9 pages, and **OHSU-EP-006/T,** 12 pages. $3.00.
Determination of recession rate along a shoreline using maps and aerial photos. Effect of coastal erosion on property. Map study, calculations. Mathematics, science, social studies.

Coastal Processes and Erosion. B.A. Kennedy and R.W. Fortner. Revised 1988. **OHSU-EP-007/S,** 12 pages, and **OHSU-EP-007/T,** 17 pages. $3.00.
Processes involved in coastal erosion and the effect of erosion on different shore materials. Shore protection devices and how they work. Laboratory. Science.

Pollution in Lake Erie: An Introduction. C.P. Basehore and R.W. Fortner. Revised 1987. **OHSU-EP-008/S,** 14 pages, and **OHSU-EP-008/T,** 17 pages. $3.00.
A 1970 essay is used to illustrate how to read skillfully and critically for facts about water quality in the lake. A current (1980) article updates and clarifies. Reading activity. Language arts, science.

Yellow Perch in Lake Erie. R.W. Fortner, G. Reil and S. Leach. **OHSU-EP-009/S,** 8 pages (revised 1985) and **OHSU-EP-009/T,** 26 pages (revised 1986). $3.00.
Introduction to fish life cycle and factors affecting population size, used as background for role-play of setting fisheries management policy. Extended to policies for 200-mile limit. Board game and simulation. Science, social studies, mathematics.

Evidence of Ancient Seas in Ohio. S. Leach and V.J. Mayer. Revised 1985. **OHSU-EP-010/S,** 9 pages, and **OHSU-EP-010/T,** 10 pages. $3.00.
Ohio rocks and minerals give evidence of the seas that formerly covered the state. Locations of economic deposits of minerals are studied. Laboratory and map study. Science, geography.

To Harvest a Walleye. S. Leach, G. Reil and R.W. Fortner. Revised 1986. **OHSU-EP-011/S,** 12 pages, and **OHSU-EP-011/T,** 20 pages. $3.00.
Basic concepts of food chains, webs and pyramids with environmental factors and energy transfer. Desirability of using lower trophic levels for human food. Board game and extensions. Science, mathematics.

Oil Spill! R.W. Fortner and S. Ihle. Revised 1987. **OHSU-EP-012/S,** 17 pages, and **OHSU-EP-012/T,** 16 pages. $3.00.
Sources of oil in water environments and methods for oil spill clean-up. Effect of oil on aquatic life. Laboratory and graphing activities. Science, social studies.

Shipping on the Great Lakes. K.N. Schlarp and V.J. Mayer. Revised 1982. **OHSU-EP-013/S,** 10 pages, and **OHSU-EP-013/T,** 10 pages. $3.00.
Commerce between lake ports illustrates regional products andneeds. Cost and energy efficiency of cargo transport methods. Data analysis. Geography, mathematics.

Geography of the Great Lakes. J.L. Timmons and R.W. Fortner. 1980. **OHSU-EP-014/S,** 17 pages, and **OHSU-EP-014/T,** 7 pages. $3.00.
Location and importance of Great Lakes areas. Distance-rate-time problems and area, perimeter, volume determinations. Map study and laboratory. Geography, mathematics, science.

Ohio Canals. V.J. Mayer and F. Pigman. Revised 1986. **OHSU-EP-015/S,** 6 pages, and **OHSU-EP-015/T,** 12 pages. $3.00.
Effects of canal building on the population and economy of cities. Canal routes are plotted and life on canal boats is revealed through a song. Map study, data interpretation. Geography, history.

The Estuary: A Special Place. R.W. Fortner and R. Mischler. Revised 1985. **OHSU-EP-016/S,** 14 pages, and **OHSU-EP-016/T,** 16 pages. $3.00.
Computer map shows land use around estuary. Simulated sampling techniques reveal life forms in and around water. Influence of people's activities considered. "Dry lab" data analysis. Science, social studies, mathematics.

The Great Lakes Triangle. R.W. Fortner and D.W. Jax. **OHSU-EP-017/S,** 17 pages (revised 1985) and **OHSU-EP-017/T,** 32 pages (revised 1987). $3.00.
Explores logical explanations for "mysterious" loss of the **EDMUND FITZGERALD** and other crafts in the Great Lakes. Considers ship construction, storm tracking and uncharted reefs. Map study, weather station models, contour map construction. Geography, science, language arts, music.

Knowing the Ropes. R.W. Fortner and V.J. Mayer. Revised 1985. **OHSU-EP-018/S,** 12 pages, and **OHSU-EP-018/T.** 12 pages. $3.00.
How ropes are made, what makes them strong, how they are (and were) used on ships. Influence of the sea on language. Laboratory activities. Science, history, language arts, art.

Getting to Know Your Local Fish. S.M. Hartley and R.W. Fortner. Revised 1987. **OHSU-EP-019/S,** 11 pages, and **OHSU-EP-019/T,** 25 pages. $3.00.
Construction and use of a dichotomous key to families of fish in Lake Erie. Creative art and writing about the origin of fish names. Science, art, language arts.

Shipping: The World Connection. R.W. Fortner and R. Pauken. Revised 1987. **OHSU-EP-020/S,** 16 pages, and **OHSU-EP-020/T,** 16 pages. $3.00.
Countries represented by ships using the Port of Toledo indicate the Great Lakes' importance in world trade. How locks work to move vessels through the lakes. Laboratory, map study. Geography.

We Have Met the Enemy. D. Briss and V.J. Mayer. 1980. **OHSU-EP-021/S,** 13 pages, and **OHSU-EP-021/T,** 58 pages. $3.00.
The War of 1812 in the Northwest, its causes, the role of Lake Erie, and the factors important in winning the war. Board simulation, analysis of original documents. History (high school level).

It's Everyone's Sea: Or Is It? V.J. Mayer and S. Ihle. Revised 1988. **OHSU-EP-022/S,** 14 pages, and **OHSU-EP-022/T,** 19 pages. $3.00.
Characteristics of the ocean floor and how international boundaries are determined. Simulation of a Law of the Sea conference. Map study, role-play. Social studies, science, history.

PCBs in Fish: A Problem? V.J. Mayer, A.J. White-Predieri, V. Steigerwald and S. Ihle. Revised 1988. **OHSU-EP-023/S,** 10 pages, and **OHSU-EP-023/T,** 25 pages. $3.00.
PCBs in Lakes Erie and Ontario and the degree to which they affect consumption of fish. Simulation of state health policies. Graph construction and laboratory demonstration. Science, social studies.

A Great Lakes Vacation. R.W. Fortner and M. Lisowski. 1987. **OHSU-EP-024/S,** 8 pages, and **OHSU-EP-024/T,** 14 pages. $3.00. Optional computer disk supplement, $4.00.
Students learn how the resources of the Lake region create attractive recreation opportunities. Small

groups serve as travel consultants for various types of vacations. This has a computer disk with runs on the Apple computer with one disk drive and color monitor which is for optional use with the activity. Geography, recreation.

Storm Surges. J. Keir and V.J. Mayer. 1987. **OHSU-EP-025/S,** 9 pages, and **OSHU-EP-025/T,** 12 pages. $3.00. Why does lake level rise and fall at the ends of Lake Erie in response to storms? Students study the action of storms over the Lake from charts and learn the causes and effects of storm surges and seiches. Science.

River Trek. R. Eddy and R.W. Fortner. 1987. **OHSU-EP-026/S,** 7 pages, and **OHSU-EP-026/T,** 10 pages; computer disk. $7.00.
A computer simulation of a flatboat trip down the Ohio River in 1791. Students learn about the perils of river travel and the geography of the Ohio River basin. Modern locations along the river are compared with their 18th century counterparts. The computer program runs on Apple with one disk drive and color monitor. Color graphics and sound add excitement to one of our most innovative activities. River Trek **cannot be done** as an activity without the computer program. History.

Waves (OHSU-EP-027) 1988. J. Keir and V.J. Mayer. Student workbook: 11 pages, Teacher guide: 9 pages.

Basic concepts of wave formation and motion. Make a videotape of waves moving along a rope, to show movement of water within a wave. Investigate the concept of "letch" using a stream table. Laboratory. Science.

OHSU-EP-74/Disk. $5.00.
Independent computer programs with instructions for nine marine-related activities; some to accompany **OEAGLS EP-011, 019, 021 and 023.**

OEAGLets

Three activities are designed for the primary grade range. All three use Lake Erie information applied to all primary subject areas.

Lake Erie - Take a Bow. M. Canning and M. Dunlevy. Edited by R.W. Fortner. 1987. **OHSU-EP-031,** 69 pages. $5.00.
A unit on the geography of the Great Lakes and their importance to people. Includes background readings, worksheets, transparency masters, and activity guides. Designed and tested in Lakewood Schools, where it met with great excitement.

Build A Fish To Scale. M. Canning and M. Dunlevy, edited by R.W. Fortner. 1987. **OHSU-EP-032,** 101 pages. $5.00.
A unit about the external characteristics of fish and how these characteristics can be used to classify fish. Card games, activities, worksheets, posters and background readings included.

A Day in the Life of a Fish. M. Canning and M. Dunlevy, edited by R.W. Fortner. **OHSU-EP-033,** 87 pages. $5.00.
An 87-page unit on fish behavior, functions of body parts, and adaptations for survival. Lab activities, worksheets, background readings and transparency masters included.

Supplemental Curriculum Activities to Accompany Holling C. Holling's **Paddle-To-The-Sea. (OHSU-EP-076)** 1988. M.L. Seager, R.W. Fortner & T.A. Taylor. $10.00
168 pages of activities for grades 3-6. Science, social studies, other subjects from the children's classic. $10.00.

Marine Related Careers. OHSU-FS-012. Revised 1988. F.R. Lichtkoppier. 2 pp.
If number of fact sheets requested is 4 or less than there is no charge. For 5 to 9, postage and handling is $1.00. For 10 to 14 postage and handling is $2.00, etc.

1 to 4	No charge	25-29	$5.00
5 to 9	$1.00	30-34	$6.00
10-14	$2.00	35-39	$7.00
14-19	$3.00	40-44	$8.00
20-24	$4.00		

Ordering Instructions: Mail checks, payable to Ohio State University to:

Ohio Sea Grant College Program-Publications
Ohio State University
1314 Kinnear Road
Columbus, OH 43212-1194

Oregon State University

Sea Grant College Program
AdS A500G
Corvallis, OR 97331
(503)737-2714

The following seven items should be ordered from:

Vicki Osis
Oregon State University Hatfield Marine Science Center
Marine Science Drive
Newport, OR 97365

Water, Water Everywhere: Marine Education in Oregon, Bill Hastie. 24 pages. $2.50 plus 50 cents postage. 1986 rv.
A guide to instruction about fresh and salt water, this booklet includes information on using marine education in the classroom and on marine education resources and outdoor school sites in Oregon. Also included, upon request, is a form for ordering instructions for individual activities (i.e. "Studying Your Town's Use of Water," "Comparing the Sizes of Whales," "Water Games," and "Life Cycle of Salmon").

The Columbia River: Its Future and You. Teacher's Manual for Grades 5-8. Marcia Frost. 1985. 118 pages. $5 plus postage. **ORESU-E-85-001.**

The Columbia River: Its Future and You. Teachers Manual for Grades 9-12. Gerald Conrath. 1985. 87 pages. $5 plus postage. **ORESU-E-85-002.**
This guide and the one above study the Columbia River from a multidisciplinary approach. Combining social studies and sciences, they contain units on the history of the Columbia and on the river's use for energy, fisheries, agriculture, recreation and navigation.

Gateway to the Pacific: The Columbia River. Teacher's Resource Book. Grades 5-7. Vicki Osis, *et al.* 1986. 147 pages. $6 plus postage: $1 for 1 copy, $1.50 for 2 copies. **ORESU-E-86-001.**
Although this curriculum focuses on one port, that of Astoria, Oregon, it serves as a model for the study of ports throughout the Pacific Basin. Indeed, the goal of the Pacific Circle Consortium's Ocean Project, of which this curriculum is a part, is to teach students about the interdependence of the Pacific nations through trade. The curriculum includes lessons in latitude and longitude, ships in the harbor, cargo transfer, harbor careers, natural habitats of the Columbia estuary and a board game, "Cargo," in which students buy and sell commodities traded in countries around the Pacific.

Trashing the Ocean Purchase $17.00; rental: $2.00.
A video on marine debris.

Strip Mining the Sea: The Driftnet Problem. Rental only, $2.00; not for sale.
Video.

Marine Debris Kit. $10 loan for two weeks.
Includes a bulletin board display and two videos, *Trashing the Ocean* (on marine debris), and *Strip Mining the Sea: The Driftnet Problem.*

The following five publications must be ordered from

The South Slough Estuarine Sanctuary
P.O. Box 5417
Charleston, OR 97420
Phone: (503) 888-5558
Postage rates for the South Slough material are as follows:

Order Amount	Charge
$ 1.00-4.99	$1.00
5.00-9.99	2.00
10.00-14.99	3.00
15.00-19.99	4.00
Over 20.00	5.00

Estuary: an Ecosystem and a Resource. A Reading Guide for Grades 9-12. 1984. 56 pp. $1.25.

Estuary: an Ecosystem and a Resource. Teacher's Manual. 1984. 304 pp. $5.00.
The reading guide contains a glossary and chapters on the place of estuaries in the water cycle, physical factors in estuaries, estuarine habitats, and uses of estuaries. The teacher's manual suggests laboratory and field activities to reinforce the lessons in the reader.

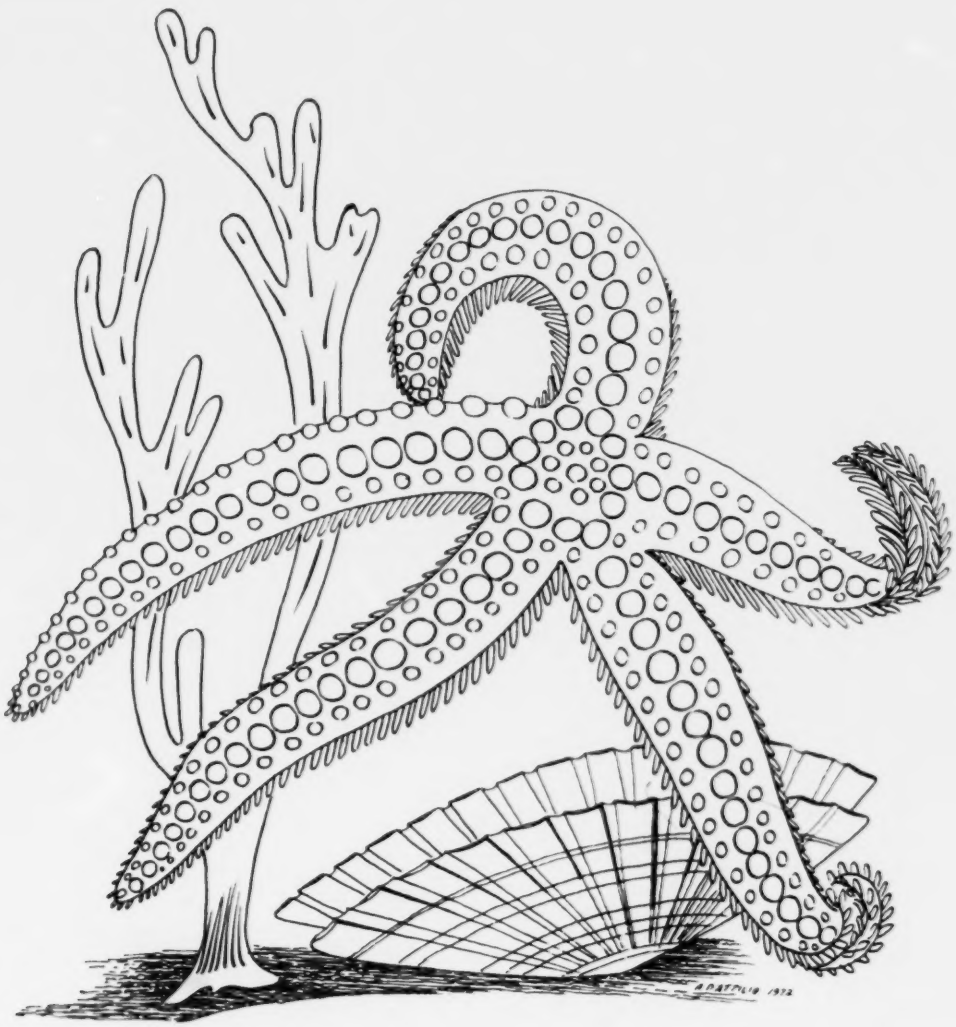
In Search of the Treasures of South Slough. Level I—Grades 4 and 5. Teacher's manual. John Garner and Karen Gartland. 1982. 59 pp. $1.50.
Students are sent on a treasure hunt to discover the "treasures of the South Slough. "They encounter four different activities, each involving a different "zone" or part of the estuary: uplands, salt marshes, mudflats, and open water. Each zone's activity helps the students get a little closer to figuring out the treasure: that this part of the estuary has been set aside as a sanctuary, a protected place for the animals and plants, with very little disturbance by people.

The Secret of the Medallion. Level II. Grade 6. Teacher's Manual. John Garner and Karen Gartland. 1982. 67 pp. $1.50.
Students are sent on an expedition to figure out the

meaning of a special medallion that was uncovered in the South Slough area. To do this, students must "unlock" the "truths" about estuaries through scientific investigations. At seven different "outpost stations" they help figure out the Big Secret of the estuary: "that the sun and the moon combine forces to support one of the richest places on earth."

The Lore of South Slough. Level III. Graces 7-8. 1981. 76 pp. $1.50.

In the morning, students join five different old-timers of the South Slough to investigate the Slough's rich cultural and natural history. These old-timers share stories of the obvious riches they were so dependent on in the South Slough area: timber, farmland, minerals, water transport, and native plants and animals. In addition, surprise visits are made by two characters that stress the hidden riches of the natural workings of the estuary: Dr. Mudflat and the Estuary Soup Chef. After an old-time lunch over an open fire, the science students may conduct scientific investigations in the different zones of the estuary. On the other hand, the social studies students may make mini-investigations of the evidence still remaining of the early activities in the South Slough.



Pacific Science Center/Washington Sea Grant

Marine Education Project
200 Second Ave. N
Seattle, Washington 91809
(206) 625-9333

Elementary Activity Packets

High Tide, Low Tide, Grades 3-4, adaptable for grades 1-2. $6.00.

This packet introduces students to 12 common rock shore animals: barnacles, mussels, limpets, periwinkles, shore crabs, hermit crabs, sea stars, tidepool sculpins, blennies, seagulls, sea anemones and sea urchins. It describes life on a rocky shore; how the animals move, gather food and behave at high tide and low tide. The packet emphasizes role-playing as a method of helping children understand the situation of living plants and animals.

Life Cycle of a Salmon, Grades 3-5. $6.00. Set of 64 slides to accompany unit, $33.00.

This unit presents important facts regarding the life cycle of salmon in Northwest waters, emphasizing the importance of clean water in our environment. It stresses the unique migration and breeding habits of salmon and relates its constant struggle for survival. This fish is one of our most important natural resources, yet the numbers of natural stock salmon are steadily decreasing in Northwest waters. This activity packet alerts learners to ways in which they can help protect the salmon's natural environment.

Waterbirds, Grades 4-6. $6.00. Set of 28 slides to accompany unit, $15.50.

This unit includes information about birds and the ecological factors that affect both birds and people. It stresses the need to understand and appreciate the dependence of birds to their feeding and breeding areas. Lists of resource people, places and reading for students and adults are attached to specific activities.

Whales, Grades 4-6. $6.00.

This packet consists of six activities; any activity may be done independently of the others. Students are acquainted with Quileute Indian and modern methods of whaling and are invited to compare the two. They investigate the mammalian characteristics of the Cetaceans and learn about some of the aspects of whale biology that suit them to life in the oceans. Students learn techniques and problems of estimating whale populations and finally take part in a simulated television news special, "The Battle Over the Bowhead," which brings together much of what they have learned.

Junior High Activity Packets

Beaches, Grades 7-9. $6.00. Full set of slides to accompany unit, $52.00. Partial slide sets available; write for details.

This is an activity packet that introduces students to the physical and biological process of the beach zone. Activities familiarize students with the beach as a habitat for plants and animals. Students will also examine the physical configuration of beaches and learn to identify and label parts of a beach. They will work toward an understanding of the processes that help form beaches. The final activity examines the impact of human use of the beach on the natural beach processes and habitats.

Beach Profiles and Transects, Grades 8-9. $6.00.

To obtain useful information about beaches or any other study site, careful measurements must be taken. The activity "Profiles" gives directions for measuring and recording the profile of a slope. In the "Transect" activity students sample populations using a single line transect-quadrant method. This activity is intended to follow up studies of beach zonation in the packet "Beaches." It requires some familiarity with intertidal organisms.

Early Fishing Peoples of Puget Sound, Grades 7-9. $6.00.

This unit presents the early Puget Sound Indian culture, emphasizing the importance of the water environment on their way of life. It stresses the people's dependence on the natural environment and the outstanding degree to which the Puget Sound region was able to provide for all their needs. As fish were one of the most important natural resources, a study of early fishing technology comprises a major portion of the unit. There are activities comparing fishing then and now, and actually making Indian hooks and lines following authentic methods as closely as possible.

Energy from the Sea, Grades 7-9. $6.00.

In this unit, students will explore the potential of offshore oil deposits, and proposals for tapping the energy of the tides, winds, currents, and ocean thermal differences. Attention is paid to the economic and environmental impact of exploiting these sources. The energy situation is a complex one with no clean-cut answers; the activities in this unit are correspondingly open-ended.

Literature and the Sea, Grades 7-9. $6.00.

This packet includes short stories, poems and excerpts from longer prose selections about the sea

and a variety of student activities to accompany them. It is divided into six activities. Ideally, the students would progress from Activity 1 through Activity 6. However, each activity may be used separately.

Tides, Grades 7-9. $6.00.
The Tides activity packet is an introduction to the nature of tides. It includes activities designed to examine the relationship between the tides and the position of the sun, moon and earth. Other activities teach students to read tide charts and explain how tide predictions are made. The skills students learn are used in a final activity that examines tidal activity in Puget Sound.

Tools of Oceanography, Grades 7-9. $6.00. Set of 16 slides to accompany unit, $9.00.
This packet is designed to familiarize the student with tools oceanographers use. It begins with the early tools that sailors developed to help them navigate the seas. It describes the first major scientific expedition and compares the equipment oceanographers use with that used on the Challenger Expedition. Minimum time for the basic activities is four days.

Senior High Activity Packets

American Poetry and the Sea, Grades 10-12. $6.00.
This activity packet presents a variety of poems about the sea, written by American poets. One section deals exclusively with poems by Pacific Northwest poets. Students are exposed to many different poetic responses to the sea and are expected to read, understand and discuss each selection.

Marine Biology Activities, Grades 7-Community College. $6.00.
This activity packet introduces students to the major themes of marine biology. Through classroom, laboratory and field trip activities, students develop an understanding of structural adaptation, behavioral adaptation, zonation and habitat. This packet includes teacher background information, student handouts and tests.

Marine Biology Field Trip Sites, Grades K-Community College. $6.00.
This book provides teachers with the necessary information to select a beach field trip site in the Puget Sound region. A map and an inventory of facilities is given for each location. Checklists and sample letters are provided as models to aid the teacher in planning the field trip.

Marshes, Estuaries and Wetlands, Grades 10-12. $6.00.
This activity packet introduces students to the watershed system. Activities help students look at both the salt and fresh water environments. An overview activity provides students with an opportunity to make and express their observations about fresh and salt water habitats. It allows them to view watersheds from a holistic perspective. Other activities focus more closely on field and lab investigations of salt marshes and estuaries. Finally, students are given a working model by which they can inventory fresh water wetlands in and near their communities. The inventory, based on the one used by King County Resource Planning Division for their wetlands survey, focuses on the physical, biological, aesthetic, visual and educational value of wetlands.

Squalls on Nisqually: A Simulation Game, Grades 10-12. $6.00.
This is a simulation game about land use decision making in a coastal zone environment. The simulation is based on a land use proposal submitted by the Weyerhauser Company for the development of land near the Nisqually Delta. The students are given the background to the historical development of the Nisqually Delta and relevant information from the Environmental Impact Studies completed for the Nisqually. Through role-playing, students learn about the socio-political and economic interaction involved in a decision-making process. Students are encouraged to research their roles and determine positions based on the data. This simulation process can be easily adapted for other land-use issues.

Ordering Instructions: Mail checks, payable to Pacific Science Center to:

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200 Second Avenue North
Seattle, WA 98109

** Shipping charges are extra. Include 75 cents for each item ordered.*

** Washington residents add 7.9% sales tax.*

University of Puerto Rico
Sea Grant College Program
UPR-RUM, P.O. Box 5000
Mayagüez, Puerto Rico 00709-500
(809) 834-4726

How to Find Information about the Sea in School and Public Libraries / Como Localizar Informacion Sobre Temas Marineos en las Bibliotecas Publias y Escolares. A. Ortiz. **PRU-E-1.**
The purpose of this pamphlet is to assist students and teachers in the utilization of libraries in their search for marine-related information. Included are: a brief list of marine-related periodicals frequently found in school and public libraries, suggested local educational institutions with library resources concerning the sea, and a compendium of basic scientific names and plant and animal classifications.

Let's Learn about the Sea/Conozcamos el Mar. Vangie F. Hernandez. $5. **PRU-E-8.**
This 135-page publication is a textbook designed to be used by junior and senior high school students attending a Sea Grant-operated marine summer camp, Cajaya Marine Festival. The text, a general introduction to the sea, is divided into four sections; the first three concern Marine Inhabitants, Physics of the Sea, and the Coasts of Puerto Rico, while the fourth deals with specific activities conducted at the camp. The text contains a glossary of terms, numerous examples, and illustrations with review exercises at the end of each section.

Voices of the Sea/Vocero del Mar. Loreina Santos-Silva. $2.50. **PRU-E-15.**
This 70-page book of poetry by Mayaguez poetess Loreina Santos-Silva is a collection of poems based on conversations with Puerto Rico fishermen. Many legends and local sea stories are preserved in these poems of which a number are beautifully illustrated with pen and ink drawings by Alicea, a well-known Puerto Rican artist.

Careers in Marine Sciences/Carreras en las Ciencias Marinas. Marie Beatriz Riesco. PRU-E-16.
This publication serves as a guide to students who are considering a career in marine sciences by focusing on reality rather than the glamorous aspects. As a result of erroneous propaganda, this field attracts too many confused students. We hope this publication, presented in the form of questions and answers, will throw some light on the decisions of our future scientists.

The Sea: Medium and Subject in Making Art/El Mar: Como Medio y Tema para Hacer Arte. Fèlix Zapata. **UPRSG-E-17.**
A concise presentation of the results of Research Project R/E 14 of the Sea Grant Program. The work was carried out in the Art Workshop of the Department of Humanities, University of Puerto Rico, Mayagüez Campus. It is a study of the properties of marine vegetation for making paper, a study of the usefulness of marine rock in sculpture; the creating of mosaic from shells and rocks of different colors; a study of marine materials high in calcium and silica for making ceramic glazes.

Marine Mammals of Puerto Rico/Mamiferos Marinos de Puerto Rico. J.A. Suárez-Caabro. $2.00. **UPRSG-E-20.**
A record of sightings of marine mammals around the coasts of Puerto Rico, written by J.A. Suárez-Caabro, Ph.D., is based on reports from various sources. The beautiful illustrations serve as a guide to the marine mammals watcher.

Marine Vegetation and Its Uses/La Vegetación Marina y sus Usos. Sylvia Vélez. **UPRSG-E-21.**
A useful summary of some of the marine vegetation

that can be found on our coasts. The world of marine plants, as compared to the world of earth plants, is unknown to most of us. The author strives to get the reader acquainted with the nature, usefulness and beauty of it. Beautiful pen and ink illustrations, rendered by the author are included.

On the Verge, Limericks on the Life and Times of the Queen Conch/Al Borde, Quintillas sobre la Vida del Carrucho. Richard S. Appeldoorn, Ph.D. $1.25. **UPRSG-E-36.**

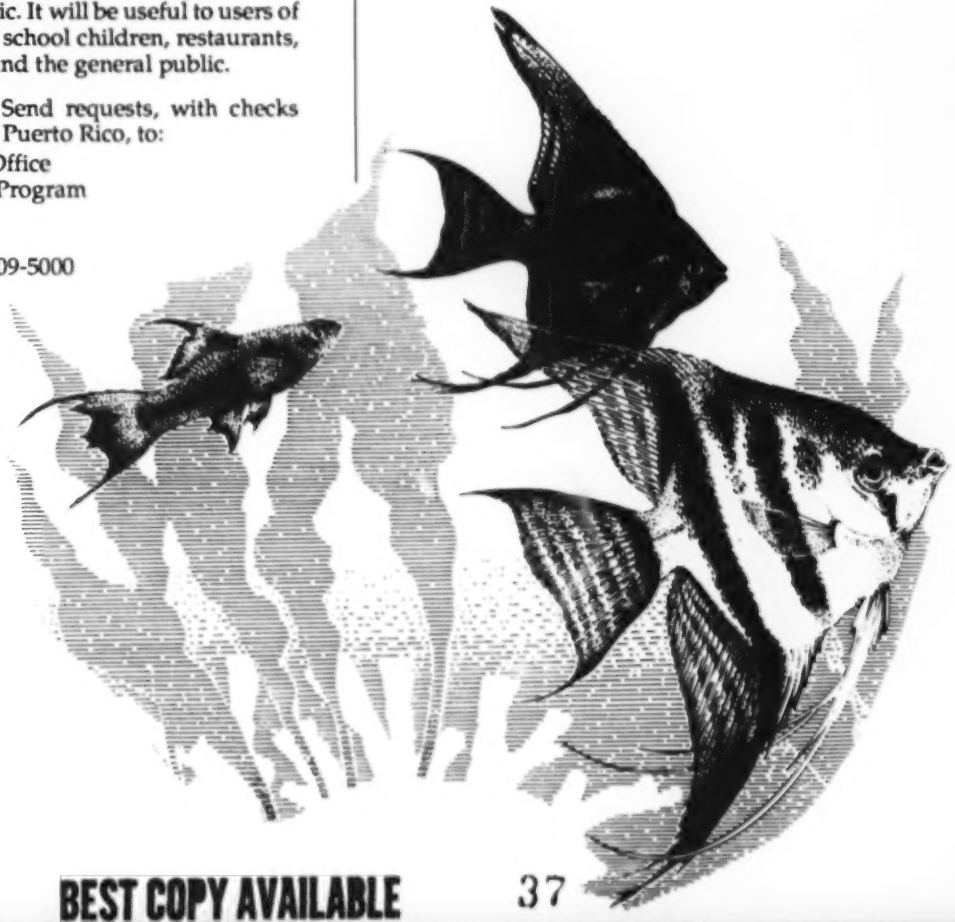
The book reviews aspects of the life history, ecology, fisheries and lore of the queen conch, perhaps the most well-known marine gastropod and symbol of the Caribbean region. Written in a popular style for the laymen and anturalist alike, it presents scientific facts and hypotheses in the form of limericks. Each limerick is whimsically illustrated and annotated, providing further explanation or comments. It is, thus, both educational and fun to read. The book should appeal to anyone with an interest in the Caribbean, shell collecting and marine biology.

Fishes of Puerto Rico/Peces de Puerto Rico. Vangie Fradera Hernández. $3.00.

Fishes of Puerto Rico is a simple but useful publication that can be used as a guide for the identification of some of the most common fish in this area. The fishes are divided into eight major groups and classified by their common names in Spanish and English, and taxonomic. It will be useful to users of the marine resources, school children, restaurants, consumers, libraries and the general public.

Ordering Instructions: Send requests, with checks payable to University of Puerto Rico, to:

Communications Office
Sea Grant College Program
U.P.R.-RUM
P.O. Box 5000
Mayaguez, PR 00709-5000



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Rhode Island Sea Grant
University of Rhode Island Bay Campus
Narragansett, Rhode Island 02882-1197
(401) 792-6800

An Interpretive Atlas of Narragansett Bay. Stephen Olsen, Donald D. Robadue, Jr. and Virginia Lee. 82 pages. **P866.** $5.95.
Beautifully illustrated with large colored maps and charts, as well as black-and-white photographs of marine life and historical scenes, this popular atlas summarizes in layman's terms the most interesting and useful information about one of the world's most-studied estuaries. Topics covered include: storms, hurricanes and flooding; plankton; finfish; commericial fishing; shipping; land use in bayfront towns; and pollution.

An Elusive Compromise: Rhode Island Coastal Ponds and Their People. Virginia Lee. 82 pages. **P879.** $5.
Coastal ponds are fragile ecosystems, particularly vulnerable to stresses caused by human activity. Historically, Rhode Island's coastal ponds have been highly productive sources of oysters and fish. Since World War II, humans have altered the ponds in many ways, dredging them for recreational boating, constructing permanent breachways, and building large numbers of houses on pond shores. The effects of human activities on eight Rhode Island ponds are analyzed in this book, which includes maps, photographs, line drawings, tables, and 166 references.

Narragansett Bay Poster. P1068. $5.00.
This brilliantly colored 18-by-24-inch poster, showing the contour of the floor of Narragansett Bay, was produced by 3-D computer modeling.

Overview of Narragansett Bay. 4 pages. **P1065.** $1.
Everything from what Narragansett Bay looked like 9,000 years ago to the most up-to-date boating and fishing statistics can be found in this fact-filled summary. The report includes three maps; a table listing 16 of the bay's physical characteristics (volume, deepest point, salinity, etc.); and discussions of biology and pollution in the bay.

Pollution Impacts from Recreational Boating: A Bibliography and Summary Review. Andrew S. Milliken and Virginia Lee. 6 pages. **RIU-G-90-002. P1134.** $4.
This report provides an excellent starting point for anyone studying the growing problem of boat pollution. The first half is a review and summary of available information on the sources and effects of the four main types of pollution associated with recreational boating (sewage, plastic debris, toxic boat paints, and engine-associated pollutants). The second half is a comprehensive 170-entry bibliography, arranged by subject. of relevant research papers, technical reports, government publications, and workshop proceedings.

National Directory of Citizen Volunteer Environmental Monitoring Programs, 3rd Edition. Virginia Lee and Eleanor Ely. 42 pages. **RIU-D-90-001. P1135.** Free.
The volunteer environmental monitoring movement is burgeoning and so is this popular directory, newly revised and expanded to include 133 programs. The majority of these programs monitor water quality, but programs monitoring everything from acid rain to boating activity to butterflies are also listed here. Program descriptions contain details about how samples are analyzed, where funding comes from, and how data are used by government agencies—all of which should be especially useful to anyone wishing to start a new monitoring program.

Winter Flounder in Rhode Island Coastal Ponds. Richard Crawford. 24 pages. **RIU-G-90-001. P1133.** $2.
Fishing for winter flounder in Rhode Island's coastal salt ponds has long been a popular sport. These flounder have also been the target of commercial fishing efforts. But catches have been declining in recent years. This booklet, based on Rhode Island Sea Grant—sponsored studies, investigates possible reasons for the decline, including the effects of dredging and fishing pressure. Winter flounder life cycles and spawning habits are also covered.

Fishing for Eel in Rhode Island Coastal Ponds. Richard E. Crawford. 4 pages. **RIU-G-88-003. P1067.** Free.
The reasons behind the rise and subsequent decline of Rhode Island's commercial eel fishery, and the prospects for a revival of this industry, are analyzed in this illustrated report. The report also describes the unusual life cycle of eels and covers techniques, equipment, and bait used for catching eels. Eel recipes are included.

Marine Plastic Pollution and MARPOL Annex V. Thomas Brillat. 4 pages. **RIU-G-89-005. P1125.** Free.
Get the very latest information on new U.S. Coast Guard interim rules about plastic pollution and waste disposal by boats and terminals. The regula-

tions, which went into effect May 30, 1989, will affect recreational boats, fishing vessels, merchant vessels, ports, and marinas.

Safe Alternative to TBT for Wooden Lobster Traps. 2 pages. **RIU-G-89-002. P1120.** Free.
Rhode Island Sea Grant researchers have developed a new salt-dip technique that protects offshore wooden lobster traps from trap worm damage. This method provides a simple, safe, effective, and economical alternative to dips containing the caustic chemical TBT (tributyltin). Step-by-step instructions for building a dip tank, preparing a saturated salt solution, and dipping traps are given in this fact sheet.

Depth-Area-Volume Relationships in Narragansett Bay. Richard A. Chinman and Scott W. Nixon. 64 pages. **RIU-T-85-004. P1005.** $5.
Using figures and tables, this atlas presents extensive depth, area, and volume data for Narragansett Bay, including contour maps, hypsographic curves, and bathymetric profiles.

Fish of Narragansett Bay Poster and Brochure. LaVie McDonald and Ellen Yoder. Poster **RIU-G-90-005. P1144.** $10. Brochure **RIU-G-90-006. P1145.** 8 pages. One copy included free with poster. Additional copies, 25 cents each.
Lushly printed in six colors, this dramatic large-format (39 x 16.25 inch) poster illustrates 16 fish species commonly found in Narragansett Bay. The fish are accurately rendered in bright colors and swim against a vivid blue and green background. Accompanying the poster is a brochure that details the fish size, physical characteristics, where found, how caught, prey and additional remarks. The brochure is printed on recycled paper.

The Changing Role of Today's Harbormaster. Mark Amaral. **RIU-G-90-004. P1142.** 12 pages. $2.
This booklet, based on a survey of all New England harbormasters, assesses the current issues facing today's harbormasters. It includes information on the changing background of harbormasters, organization of the harbormaster office, developing trends in law enforcement and mooring regulations, current training, and training that will be necessary in the future.

Air-Sea Rescue Procedures Videotape. The University of Rhode Island and U.S. Coast Guard. **RIU-F-90-001. P1141.** 20-minute videotape. $15.
A U.S. Coast Guard air-sea rescue is a tricky maneuver at best. Unfortunately, in many cases the people being rescued compound the difficulty and danger because they do not understand rescue procedures. In this educational video, Coast Guard personnel demonstrate several rescue techniques and give step-by-step instructions for those being rescued. This potentially life-saving information is vitally important for anyone who uses a boat. Procedures covered in the video are: Delivery of equipment (such as pumps or medical supplies) or personnel from a helicopter to a vessel; evacuation of people from the water or rafts to a helicopter; and medical evacuation of a sick or injured person from a boat to a helicopter.

Fact Sheets. One-page flyers (order by number). Free.
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The Role of Grass Shrimp in a Tidal Marsh Ecosystem. P833.Abyss. P858.
Point Judith and Its Fishermen. P878.
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Rhode Island Swans: Beauties or Beasts? P1082.
Red Tide in the Northeast. P1099.
Quahog. P1123.

Ordering Instructions: Please add $1 (for postage and handling) to listed price. Send an order form, along with payment, to:

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University of Rhode Island Bay Campus
Narragansett, RI 02882-1197

South Carolina Sea Grant Consortium
287 Meeting Street
Charleston, SC 29401
(803) 727-2078

Sea Sampler: Aquatic Activities for the Field and Classroom (Secondary). Wendy B. Allen and Patty O. McLaughlin. 114 pages. $4.00. **SCSG-TR-85-2.**
A guide for grades 7-12 to successfully tested aquatic activities for the field and classroom, including how to set up a marine aquarium; how to conduct a beach study, salt marsh study and freshwater marsh study; classroom projects on food chain connections, brine shrimp and more.

Sea Sampler: Aquatic Activities for the Field and Classroom (Elementary). Wendy B. Allen and Patty O. McLaughlin. 118 pages. $4.00. **SCSG-TR-85-1.**
A guide for grades K-6 to successfully tested aquatic activities for the field and classroom, including how to explore a pond community, a beach, a marsh; discovering how a clam's siphons work; classifying beings and things; investigating osmoregulation and more.

A Guide to Common Whelks. Arnold G. Eversole and William D. Anderson. 24 pages. Free. **SCSG-MEP-85-1.**
An illustrated guide to the four species of whelks commonly found along the South Carolina coast, including shell and egg capsule keys and tasty whelk recipes.

A Guide to Common Jellyfishes of South Carolina. Dale R. Calder and Margaret C. Pridgen. 12 pages. $1.00.
An illustrated guide to these misunderstood inhabitants of our coastal waters with information on their life history, identification, and what to do if you are stung.

Red Tide: The Facts. Mel Goodwin and Virginia Beach. 11" X 17" Poster. Free.
A handy poster for dispelling the myths and promoting the facts concerning red tide.

Coastal Heritage Newsletter. John Tibbetts, Editor. Free.
The quarterly newsletter of the South Carolina Sea Grant Consortium featuring a wide range of topics, including aquaculture, water safety, storm water pollution, wetlands and climate change. Also includes a listing of new publications and current programs.

What's Happening in Charleston Harbor? Charleston Harbor Estuary Citizens Committee. 13 pages. Free.
Scientific inquirey and problem solving prepared for the Charleston County School District. Student and teacher editions.

Reuse or Recycle: Don't Throw It all Away. Free.
A checklist of innovative ways to reduce waste at home, at work and school, at the store, on weekends and in your car and yard.

Hurricane Preparation Checklists. Free.
A handout listing basic preparations, supplies and recommendations in the event of a hurricane.

Recycle, South Carolina! 28 pages. Free.
A guide to reducing solid waste at home and in the community. It outlines a step-by-step process for research and development of a recycling program that includes a county-by-county guide to projects and materials recycled in your area.

Cleaning Up Our Act; Our Valuable Wetland Resources; How to Plant a Dune.
Three 20-minute slide presentations with script and accompanying handouts which can be borrowed without charge for presentation to schools, civic and church groups, and other community organizations.

Ordering Information: Make checks payable to the SC Sea Grant Consortium and send with order to:

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287 Meeting Street
Charleston, SC 29401.

University of Southern California Sea Grant Institutional Program
Hancock Institute for Marine Studies
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Los Angeles, California 90089-1231

Wet & Wild: Six Bilingual Supplementary Marine Curriculum Guides for Teachers, K-6.
Six units, each in English and Spanish, contain introduction of background information for teachers, approximately 25 multidisciplinary lesson plans in each unit and a list of reference books and films. Published by USC Sea Grant and the Evaluation, Dissemination and Assessment Center for Bilingual Education, California State University, Los Angeles.

Unit 1: The Physical Ocean. 171 pp. **(USCSG-ME-01-83).** $10.

Unit 2: Ocean Management. 66 pp. **(USCSG-ME-02-83).** $8.

Unit 3: Research. 146 pp. **(USCSG-ME-03-83).** $10.

Unit 4: The Biological Ocean. 180 pp. **(USCSG-ME-04-83).** $20.

Unit 5: The Economic Sea. 150 pp. **(USCSG-ME-05-83).** $18.

Unit 6: Marine Ecology. 188 pp. **(USCSG-ME-06-83).** $23.00

Complete Set (Units 1-6). $85.

Tuga the Turtle. Dorothy M. Bjur. **USCSG-ME-03-82.** $6.
This children's book is in Grade Two Braille and large letters. It tells the story of a sea turtle who ends up in a tide pool and learns about tidal animals.

Mini-Information Booklets: Tidepool animals/Los animales que viven in las pzas de la marea; Sharks and Other Sea Creatures/Los tiburones y othros animales marinos; Fantastic Marine Animals/Fantasticos animales marinos. **USCSG-ME-02-82.** $12. Three booklet set with each booklet containing approximately 50 mini articles, in both English and Spanish, about marine animals, their characteristics and behavior.

Marine Studies Idea Book: For Teachers, Grades K-6. English or Spanish (please specify). **USCSG-ME-01-82. $8.**
A resource book of ideas and activities for the development of lesson plans by teachers, available in either English or Spanish for use in bilingual and international programs.

Dimensions of the Sea. Marine Education slide sets with narrative for grades K-graduate level.
Each set contains 35 mm color slides on the marine communityand environment, accompanied by a written narrative that can be adapted by teachers to the appropriate grade level. The narrative is available in either English or Spanish. Sets **(USCSG-ME-04-82)** include:
The Physical Ocean (13 slides) $11.00
Ocean Management (15 slides) $12.00
Ocean Research (15 slides) $12.00
The Biological Ocean (22 slides) $16.50
The Economic Sea (27 slides) $20.00
Marine Ecology (44 slides) $33.00
Complete Set (136 slides) $95.00

On the Waterfront: Teaching Seaport Management. Jenny Cashman. Reprinted from *Sea Grant Today* 12(1):12-13, 1982. **USCSG-R-09-82.** $1.

Gamming with Dorothy Bjur. Stephanie Yoder. Reprinted from *Current, The Journal of Marine Education* 2(4): 16-17, 1981. **USCSG-R-09-81.** $1.

Marine Education in Spanish. Shirley J. Hudgins. Reprinted from *Sea Grant Today* 10(3): 12-13, 1980. **USCSG-R-03-80.** $1.

Downtown Aquaculture (Inner-City Marine Education). Dorothy M. Bjur. Reprinted from *Current, The Journal of Marine Education* 1(3): 11-12, 1980. **USCSG-R-02-80.** $1.

Wet and Wild (Marine Studies for the Visually Impaired). Shirley J. Hudgins. Reprinted from *Sea Grant Today* 9(8): 3-5, 1979. **USCSG-R-12-79.** $1.

An Innovative Approach to Teaching Marine Sciences. Dorothy M. Bjur. Reprinted from *Revista de Biologia Tropical* 26 (Suppl. 1): 9-13, 1978. Available in English and Spanish. **USCSG-R-03-79.** NTIS-PB-299130/AS. $1.

Teaching Marine Studies When You Don't Know a Snipe From a Sea Cucumber. Gail Ellison. Reprinted from *Sea World*, Fall 1977. pp. 33-35. **USCSG-R-05-77.** $1.

The Role of Sea Grant Education. Dorothy M. Bjur. Reprinted from the *Journal of Marine Education*, Fall 1976, pp. 10-12. **USCSG-R-04-76.** $1.

Ordering Instructions: Make checks payable, by a U.S. bank, to USC Sea Grant Program. Mail request with check to:

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Marine Education Program
University Park
Los Angeles, CA 90089-0341

Texas A&M University
Sea Grant College Program
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Galveston, Texas 77553-1675
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Sea Sources. 192 pages. All levels. **TAMU-SG-79-402 (rev).** $4.
Selected bibliographic and resource materials on children's literature of the sea are gathered in this useful compendium for teachers and librarians. The 192-page book includes 745 titles in 10 categories: Information; biographies/explorers; fiction; picture books; whales and sea mammals; folk and fairy tales; poetry/songs; activities; short stories and selected chapters; and bibliographies.

Aquatic Science: Marine Fisheries Biology. 18 pages, 21 illustrations. Grades 4-12. **TAMU-SG-79-405. (rev.)** Single copies free.
This illustrated booklet focuses on animal life in the marine areas of Texas and can be used as a handbook for the novice beachcomber or as an educational supplement in the classroom. Information is available on waves, tides and currents; shoreline organisms; estuaries; coastal food chains; fish and shellfish identification (including descriptions and line drawings of fish indigenous to Texas marine waters); and special project ideas related to the life history and management of coastal organisms. A list of related reading materials is included.

Children's Literature-Passage to the Sea. 56 pages, 4 questionnaires. Grades K-7. **TAMU-SG-80-401.** $2.
This marine awareness learning package is based on eight books by nationally recognized authors. At least one book is appropriate for each elementary grade and all have a sea or coastal setting. Each book is related to interest center activities that allow students to experiment with or express what they have learned. Complete directions for 39 activities are included; related to language arts, music, art, science and social studies.

Marine Organisms in Science Teaching. 192 pages. Grades 4-12. **TAMU-SG-80-403.** $4.
This laboratory-oriented workbook includes 42 activities for using living marine organisms in existing science programs. The workbook is presented in a discovery type format that includes two sections for the teacher, a pre-lab and a post-lab, and a student investigation section. Student sections are formatted to allow easy duplication on school copying equipment. The activities use such organisms as brine shrimp, oysters, ghost, fiddler and hermit crabs, sea anemones, barnacles and sponges.

Fairy Tales of the Sea. 152 pages, 9 original illustrations. Grades. K-12. **TAMU-SG-81-402.** $4.50.
This collection of fairy tales includes tales from every inhabited continent-America, Asia, Australia, Europe and Africa - so that American children (and adults) can enjoy their varied heritage. It is believed that the collection is the only volume of international folk and fairy tales exclusively about the seas. The tales, 25 in all, range from the familiar - such as Hans Christian Andersen's *The Little Mermaid* - to the lesser known - such as Pearl Buck's adaptation of *The Flying Ship*. The book is designed in an easy-to-read format to allow even the youngest readers enjoy the fairy tales. While the collection is complete in itself, there is an accompanying teacher's guide (**TAMU-SG-81-403**) that suggests varied classroom uses.

Fairy Tales of the Sea Teacher's Guide. 28 pages. Grades 409. **TAMU-SG-81-403.** $2.
The communication potential of *Fairy Tales of the Sea* lends itself to a language arts curriculum. This guide is written with objectives according to the English Language Arts Curriculum Framework suggested by the Texas Education Agency. Activities cover the language arts of listening, reading, speaking and writing. Although designed for grades 4 through 9, there are some activities suitable for younger or older students who are particularly motivated toward study of the sea.

Marine Education - A Seagoing Educational Experience. 28 pages, 3 data sheets. Grades 7-12. **TAMU-SG-83-401.** $1.25.
This workbook was prepared as part of a working cruise program for high school students and teachers that is offered by The University of Texas Marine Science Institute at Port Aransas. The book also may be useful to high school and junior college science students and teachers who have access to a research vessel. Included are descriptions of the Corpus Christi Bay area and the study sites, field equipment, analytical procedures and data collection. Detailed instruction for onboard activities are given.

Life on Board American Clipper Ships. 36 pages, 3 photographs, 2 drawings. Grades 7-12. **TAMU-SG-83-402.** $1.
Author/archivist Charles Schultz has relied on sailors' actual diaries and logs kept by clipper ship captains. The book also includes an introduction that defines the clipper ship era, suggestions for further reading and a glossary. Photographs of

American-built clipper ships, supplied by Mystic Seaport Museum, are included, as is a redrawing of an 1850-era world chart that shows the major routes followed by the clipper ships. In addition to its interest to the general reader, this book is intended to supplement English or American history classes in grades 7 through 12. It also can be used with younger, gifted students.

Bird Island Basin Environmental Study Area. 36 pages. Grades 7-12. **TAMU-SG-86-401.** $2.
The concept of environmental study areas was a direct outgrowth of the 1970s ecology movement. The idea was to designate specific areas where school groups, youth groups or others could be demonstrated. The Bird Island Basin Environmental Study Area, located at Padre Island National Seashore, is just such a place. This guide contains a number of exercises that are designed as points of departure for hands-on learning experiences. Most of the activities are presented in a format similar to high school-level laboratory experiments. Although written with the Bird Island Basin area in mind, they can be easily adapted to other environments. Many of the activities can be done on the school lawn, on the playground or in a nearby park.

Annotated Guide to the Barnacles of the Northern Gulf of Mexico. 36 pages. Grades 9-12. **TAMU-SG-86-402.** $3.
The 49 species of thoracican barnacles (the goose and acorn barnacles) that are known to occur in the northern Gulf of Mexico are differentiated by a taxonomic key based on external characters, with extensive illustrations and a glossary. The guide also includes an annotated list of these species and three systematically questionable ones, with areal range, bathymetry, substratum type and other data; a list of 16 species that have been found in the southern Gulf of Mexico but not in the northern Gulf; directions for collecting and examining specimens, and a list of references especially useful for further study of particular groups.

Texas Coast Hurricanes. 24 pages. Grades 4-12. **TAMU-SG-86-505.** Single copies free.
Designed to help coastal residents understand, prepare for and recover from the effects of hurricanes, the book includes tracking charts, probability of hurricane occurrence, guidelines for individual responsibility, checklists to help residents plan for safety, hurricane names through 1991, definitions of hurricane-related terms, and descriptions of Texas' most notable storms of the past 20 years. The checklists, definitions and directions for hurricane tracking are in both English and Spanish. The book includes many of the articles and photographs first published in Sea Grant's *Texas Shores* magazine.

Questions About Careers in Oceanography. 18 pages, 5 photographs. Grades 7-12. **TAMU-SG-87-401.** Single copies free.
A handy guide to the field of oceanography, this booklet is a response to inquiries by young people considering a career in the discipline. Questions such as "What is an oceanographer?," "Where does one study oceanography?," and "Who hires and supports oceanographers?" are posed and answered. Additional sources of information are cited in the text, and complete addresses for these agencies and organizations are provided.

Vocational-Technical Marine Career Opportunities in Texas. 22 pages, 7 photographs. Grades 7-12. **TAMU-SG-80-402r.** Single copies free.
This booklet is to assist high school counselors, teachers and students better understand the career opportunities available in the Texas marine industry. It provides background information and descriptions of jobs in the maritime transportation, offshore mineral, oil and gas commercial diving, commercial fisheries and shipbuilding industries. Information about the training needed to enter particular positions also is included. Organizations and schools, with addresses, are listed at the end of each section for reference.

How to Set Up and Maintain a Saltwater Aquarium. 8 pages, 7 illustrations. Grades 3-12. **TAMU-SG-81-504.** Single copies free.
This pamphlet outlines the basic steps to establishing a saltwater aquarium anywhere in the country. Presented in as simple language as possible, with accompanying cartoon illustrations, the guide is designed for young children, but is equally useful for older students and adults. Detailed instructions are given on the materials needed, food preferences, synthetic saltwater, filter systems and potential problems.

Hurricane Warning! 12 pages. Grades K-7. **TAMU-SG-82-401.** Single copies free.
Owlie Skywarn talks about hurricanes in a style written for elementary students. Printed in large type for easy reading, the brochure tells of Hurricane Camille in story form and includes a checklist of do's and don'ts when a storm threatens. There also is a safety certificate (to be signed by a teacher or other adult), signifying that the student knows the appropriate safety rules.

Water: How Safe Are You? 8 pages. Grades 4-12. **TAMU-SG-87-402.** Single copies free.
As the weather turns hot there is nothing so inviting as the thought of cool water and swimming, skiing, boating, fishing, or just lazing away the afternoon. Each year in Texas an average of 650 people get so involved in their activities that the end result is death by drowning. Since most victims are teen-

aged males between 15 and 19 years old, this bulletin points out some of the more obvious, but often forgotten, safety practices. Written primarily for a teenaged audience, it covers swimming, river recreation and boating. It includes a list of reference brochures, films, books and courses that can be used to supplement water safety instruction.

Field Trips...Logistics is Key to It All. 4 pages. Grades 7-12. **TAMU-SG-83-402.** Single copies free.
Science field trips provide opportunities for students that can make the teacher's work well worth the effort. The excursion allows students to see and experience things they have never seen or felt before, and creates a hands-on approach to study. To be successful, a field trip must be thoroughly planned. This monograph provides teachers with detailed, step-by-step guidelines to follow in planning a field trip, taking one and following it up in the classroom. Post-trip evaluation guidelines and references also are included.

Venomous Marine Animals. 25 x 18" poster. Grades K-12. **TAMU-SG-82-403.** $1.
Ten categories of potentially dangerous marine organisms are illustrated on this poster - jellyfish, catfish, rays, sea urchins, toadfish, stargazers, worms, sponges and the octopus. The accompanying descriptions can help people become more aware of how problems with these animals might develop, how they can be avoided and how certain injuries should best be treated if they occur.

Whales and Dolphins Off the Texas Coast. 36x23" poster. Grades K-12. **TAMU-SG-84-505.** $3.
This poster depicts the five species of whales and dolphins most frequently stranded along the Texas coast. This is a full-color reproduction of a specially commissioned work by artist Lori Grassman. The Atlantic bottlenosed dolphin, spotted dolphin, pygmy sperm whale, beaked whale and great sperm whale are included, along with a brief description of each species. An accompanying fact sheet includes additional scientific information on these species, and is sent free with all school orders.

Texas Rips! 11x17" poster. Grades K-12. **TAMU-SG-84-506.** Single copies free.
This water safety poster delivers a warning message about the dangerous rip currents along the Texas coast. A high percentage of drownings occur each year when swimmers or waders are caught in rip currents adjacent to rock groins, jetties or piers. The poster also includes a description of how to escape a rip current should a person be caught.

Texas Shores. Quarterly magazine. Subscriptions $7.50 per year.
This 28-page thematic magazine examines issues affecting the Texas marine environment in detail. While the focus is one Texas' coastal environment, many of the issues are similar to those facing other regions of the country.

A Second Chance for South Bay. VHS format. $20.00.
This video addresses the first bay to be designated as part of the Texas Coastal Preserve Program. South Bay is one of three hypersaline lagoon systems in the world.

Hooked on Seafood. VHS format. $20.00.
If fear of failure keeps you from cooking seafood at home, this entertaining and educational video provides a step-by-step guide to success. Designed for home economics classes, the video reveals the secrets to buying and preparing quality fish and shellfish. Quick, earily prepared recipes are also demonstrated in this handy reference for the novice as well as the seasoned pro.

Trashed Out Texas Beaches. VHS format. $20.00.
This educational video helps students and teachers alike understand the cost of ocean dumping in terms of marine life and the actual cost of cleaning the state's beaches.

Balancing Act. VHS format. $20.00.
This documentary explains the purpose of the new Galveston Bay National Estuary Program and illustrates the many uses of the Bay and the need for a comprehensive management plan. By examining the two latest additions to Texas' Coastal Preserve Program, Christmas Bay and Armand Bayou, the viewer learns more about the biological significance of wetlands and water quality and the problems confronting Galveston Bay as a whole.

Texas Shores — Saving What's Left. VHS format. $20.00.
Increasing shoreline erosion has Texas officials and landowners worried about the stability of the land and the coastal economy. This video explains what erosion is, its causes, the effects, and both historic and contemporary solutions. It also shows the environmental and economic aspects of erosion that make it a statewide problem rather than just a coastal one.

Ordering Instructions: Make checks payable to Texas A&M University. Send check or official purchase order to:

Sea Grant College Program
Texas A&M University
P.O. Box 1675
Galveston, TX 77553-1675

Virginia Sea Grant College Program
Marine Advisory Services
Virginia Institute of Marine Science
Gloucester Point, Virginia 23062
(804) 642-7170

Biology and Identification of Rays in the Chesapeake Bay. Joseph W. Smith and J.V. Merriner. Educational series No. 20, 22 pages. $ .50.
Rays, along with sharks and skates, make up a group of fishes known as elasmobranchs. The skeleton of these fishes is composed entirely of cartilage. You can identify rays either by looking at the illustrations accompanying each species description or by following the key. A key is a table of characteristics for a group of organisms arranged in couplets, one of which you choose. At the end of the chosen characteristic, you are directed to another couplet and again make a choice. The species is eventually reached.

Sensing the Sea: A Curriculum Guide for Grades Two-Three. Ellen Odell-Fisher and Ronald N. Giese. Educational Series No. 21, 53 pages. $2.
Most education is very land-oriented. Children learn shapes, colors, sizes, and textures from materials, plants, and animals found on land. There is another 70 percent of the earth that many people ignore, the sea. If young children are to develop responsible attitudes through total understanding of the earth, they must be exposed to all of its environments. The overall purpose of this unit is to arouse curiosity and interest in the aquatic divergent questions for which the student proposes possible solutions rather than deciding specific "correct" answers. Throughout these lessons, the process of investigation is most important. Facts about specific content are vehicles for developing interest in the marine environment and for teaching inquiry skills.

Sensing the Sea: A Curriculum Guide for Grades Kindergarten and One. Ellen Odell-Fisher, Ronald N. Giese and Mary E. Sparrow. Educational Series No. 23, 44 pages. $2.
In this unit, both you and your students will be working together to establish a saltwater aquarium in your classroom. Setting up and maintaining the aquarium should be carried out with and by your students. Draw up the portals and batten down the hatches! Have your students transform your classroom into a submarine preparing for a voyage to "inner space". You may enhance the illusion of a voyage by decorating your classroom windows as portholes and the door as a watertight ship's door.

The Marine Turtles of Virginia. J.A. Musick. Educational Series No. 24, 22 pages. $2.
The marine turtles are among the most interesting representatives of Virginia's migratory marine fauna. They include the leatherback (the world's largest living reptile) and four species of hard-shelled sea turtles. The latter are represented by the very large and common loggerhead, the much smaller, less common Atlantic ridley, the rare Atlantic green turtle and the Atlantic hawksbill. This booklet identifies Virginia's marine turtles, describes their habits, habitat, distribution and nesting.

The Chesapeake: A Boating Guide to Weather. John Lucy, Terry Ritter and Jerry LaRue. Educational Series No. 25, 22 pages. $1.
A more ideal boating area than Chesapeake Bay would be difficult to find along the Atlantic Seaboard. With thousands of miles of sheltered shoreline, good water depth and proximity to major urban centers, the Bay is a boatman's paradise. However, the Bay's many protected harbors and relatively narrow width (a boatman normally can keep at least one shore in sight at all times) tend to produce a feeling of false security about the need to keep a close watch on weather conditions. The purpose of this publication is to remind boatmen that the Bay has many different weather moods, some of which can change quite rapidly. In addition, it should promote a better understanding of how basic weather features develop on the Bay and enable boatmen to enjoy the Chesapeake's unique waterways with fewer weather surprises.

Handle With Care: Some Mid-Atlantic Marine Animals That Demand Your Respect. Jon Lucy. Educational Series No. 26, 13 pages. $1.50.
Generally speaking, the marine organisms found along middle Atlantic shores are not considered threatening to people. However, some of these animals can cause problems, either upon simple contact with the skin, as in the case of some jellyfish, or through careless handling. Larger inhabitants of coastal waters, such as stingrays and sharks, must always be treated with great respect because of the danger potential and their unpredictable nature. This description of nuisance and potentially harmful organisms is presented to help coastal residents and visitors become more aware of how problems with such marine animals might develop, how they can be avoided and how certain injuries should best be treated if they occur.

Fishy Activities for Your Small Fry. Mary E. Sparrow, Frances L. Lawrence and Ronald N. Giese. Educa-

tional Series No. 28, 36 pages. $2.
This kit is a collection of fishy ideas for use in your classroom. The ideas in this kit are diverse in nature and complexity. Select and adapt objectives and activities to meet the interests, capabilities and grade level of your students.

Shoreline Erosion in Virginia. S. Hardaway and G. Anderson. Educational Series No. 31, 25 pages. $1.
This booklet is designed as an introduction to the process of erosion and some of the alternative measures used to combat it. The problem of shoreline erosion is most acute when coastal property with improvements is threatened by a rapidly receding shore bank. Many waterfront properties are bought and developed each year with little or no consideration of the shoreline situation. Consequently, additional money must be spent for erosion protection structures. Virginia's coast is a dynamic and active environment as well as a beautiful place to live. Sound judgement in coastal development is essential to effective control of shoreline erosion.

Nontraditional Marine Education Activities: A Planning Guide. Elizabeth A. Cornell. Educational Series No. 32, 10 pages, plus Marine Science Method (MSM) inserts. $1.50.
To a classroom teacher, the rising cost of gasoline often means few or no field trips. If trips are still permitted, restrictions on distance may be imposed and justification required. Therefore, teachers must make any enrichment trip or alternative experience demonstrably accomplish objectives not readily achieved in the classroom. The information contained in the booklet provides guidelines to getting the most from research field trips, museum visits, resource speakers and other non-traditional experiences.

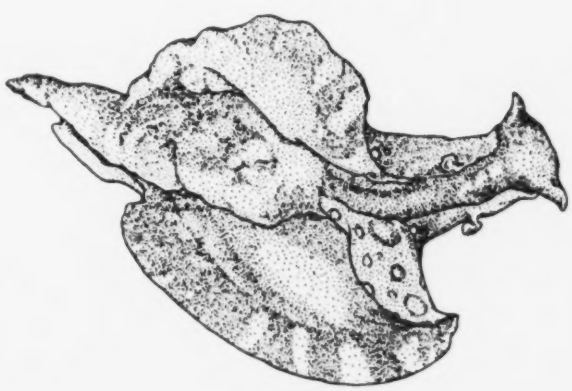
Marine Education Field Trip Sites In Virginia. Susan C. Gammisch. Educational Series No. 33, 10 pages. $1.

The Marine Mammals of Virginia. R.A. Blaylock. Educational Series No. 35, 34 pages. $1.
To aid citizens in identification, this guide describes the natural history of marine mammals. This guide is organized by taxonomic orders and families; within a subfamily, species are listed by their frequency of appearance in Virginia waters. Space limits descriptions of the species' habitats and distributions to the western North Atlantic.

Marine Education Computer Print-out Bibliography. Specify grade level and topic of interest. $5 per custom computer search.
Literature searches of the entire MEMS collection can be arranged for just $5 if request is accompanied with prepayment. A search can be custom designed to meet each individual's need, whether it be by topic, grade level, author, geographic location, type of document or year of publication. Any one or combination of the above will provide the user with an extensive bibliography of MEMS materials, custom designed to the user's needs.

Ordering Instructions: Make checks payable to VIMS. Send requests, with remittance if required, to:

Sea Grant Communications
Virginia Institute of Marine Science
Gloucester Point, VA 23062



University of Wisconsin Sea Grant

University of Wisconsin-Madison
1800 University Avenue
Madison, Wisconsin 53705
(608)263-3259

Earthwatching III: An Environmental Reader. 144 pp., 10 photographs, teacher's guide, indexed. $3.50, including postage and handling. Sea Grant Institute and the Institute for Environmental Studies, University of Wisconsin-Madison, 1989.

This book is designed to complement classroom materials on scientific and environmental topics for students in grades 4-12. It contains 200 half-page stories, an index and a teacher's guide. The stories were originally written for EARTHWATCH/radio, a two-minute public service radio program. The teacher's guide was written by Anne Hallowell. It includes Concept Mapping with Earthwatching III, Infusing Earthwatching III into Your Curriculum, Example Activity Using an Earthwatch Script, Questions for Classroom Use, and Sources of Additional Information.

Fish of Lake Michigan. 32 pages. 50¢.

A history of Lake Michigan fishery and illustrated descriptions of 21 important species of fish.

Fish of Lake Superior. 32 pages. 50¢.

A history of Lake Superior fishery and illustrated descriptions of 23 important species of fish.

The Coasts of Wisconsin. 34 pages. 50¢

Describes the physical characteristics, history and early development, and current uses and problems involving Wisconsin's Lake Michigan and Lake Superior coasts.

The Sea Lamprey: Invader of Great Lakes. 8 pages. 50¢.

Describes one of the most devastating eco-disasters in modern history - the invasion of the Great Lakes by ancient parasitic ocean fish.

Green Bay: Portrait of a Waterway. 21 pages. 50¢.

A collection of stories on the importance of Green Bay resources that originally appeared in the *Green Bay Press-Gazette* Newspaper in 1978.

Green Bay's Yellow Perch Fishery. 10 pages. 25¢.

An illustrated history of this major Green Bay fishery, its recent problems and attempts to improve it.

The Fisheries of the Great Lakes. 19 pages. $1.00.

This illustrated book profiles the primeval lakes from before the advent of Europeans to the region and traces the history of the fishery.

Eating Lake Michigan Fish. Fact Sheet. Single copies free, $4 per 100.

Explains in simple terms the problem of PCB contamination involving certain Great Lakes fish and why children shouldn't eat these fish.

Ordering Instructions: Please add $1 for postage and handling. Orders under $20 must be prepaid. Make checks or money orders payable to University of Wisconsin-Madison and send to:

Communications Office
UW Sea Grant Institute
1800 University Avenue 53705
Madison, WI 53705

Woods Hole Oceanographic Institution
Sea Grant Program
Woods Hole, Massachusetts, 02543
(508) 548-1400 ext. 2398

International Directory of Marine Science Libraries and Information Centers. Carolyn P. Winn, $15. ISBN 0-932939-03-1.

The directory represents network of cooperating libraries and information centers willing to provide assistance not only to other cooperating members, but to any investigator or interested individual seeking information in the marine sciences. The directory is available from the office of the Research Librarian, Woods Hole Oceanographic Institution, Woods Hole, MA 02543. Make checks payable to Woods Hole Oceanographic Institution.

Introduction to Oceanography. David A. Ross. 474 pages. Available from Prentice-Hall, Englewood Cliffs, NJ 07632, Fourth Edition, ISBN 0-13-491408-2.

This popular text adopts a global view of the ocean consistent with environmental issues and advances in technology that have occurred in recent years. Oceanography is explained in a manner understandable for non-scientists. The roles of separate scientific disciplines, including the social sciences are examined.

Instructor's Manual for Introduction to Oceanography. David A. Ross. Available from Prentice-Hall, Englewood Cliffs, NJ 07632.

This instructor's manual was prepared to accompany the fourth edition of the text described above. The manual draws heavily on Sea Grant materials. It includes a section on tests and testing (on a floppy disk). A set of 88, two-color acetate transparencies is available to purchasers of 50 or more copies.

Oceanography Reading List for Young Students. 22 pages. Single copies free.

This brochure, compiled by the Office of the Research Librarian of the Woods Hole Oceanographic Institution, lists reading materials in oceanography according to 17 categories.

Oceanography Reading List for Adults. 35 pages. Single copies free.

This brochure, compiled by the Office of the Research Librarian of the Woods Hole Oceanographic Institution, lists reading materials according to 22 categories.

Ordering Instructions: Unless stated otherwise, order from:

Sea Grant Program
Woods Hole Oceanographic Institution
Woods Hole, MA 02543

Single copies $2.00; contact
Sea Grant Marine Education Bibliography
Gulf Coast Research Laboratory
J.L. Scott Marine Education Center and Aquarium
P.O. Box 7000
Ocean Springs, MS 39564-7000

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